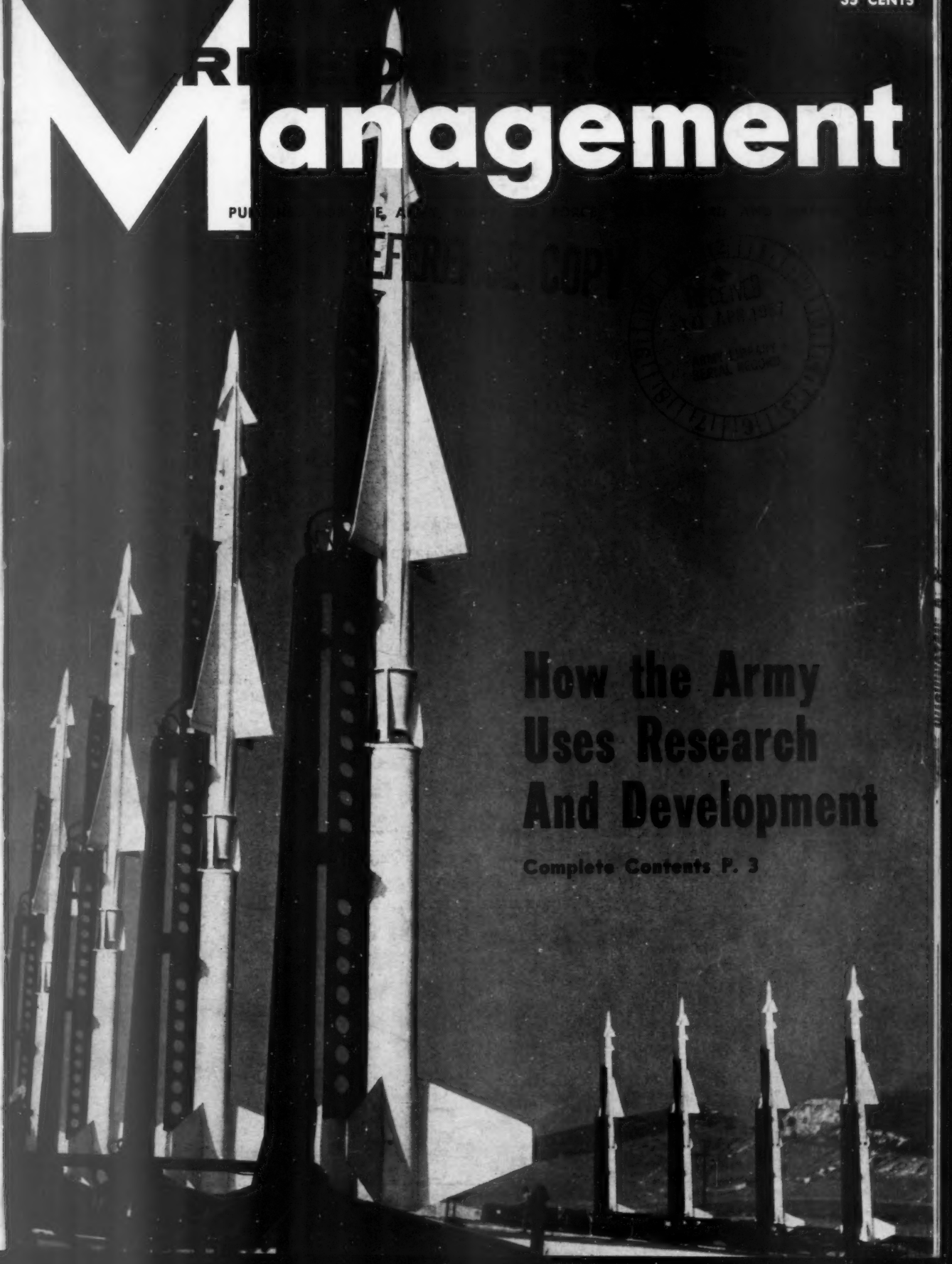
APRIL 1957
35 CENTS

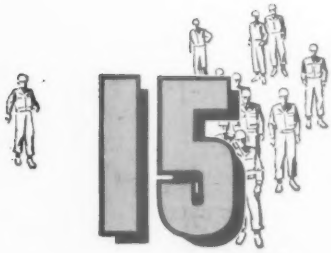
Management

PU[illegible] E. A[illegible]

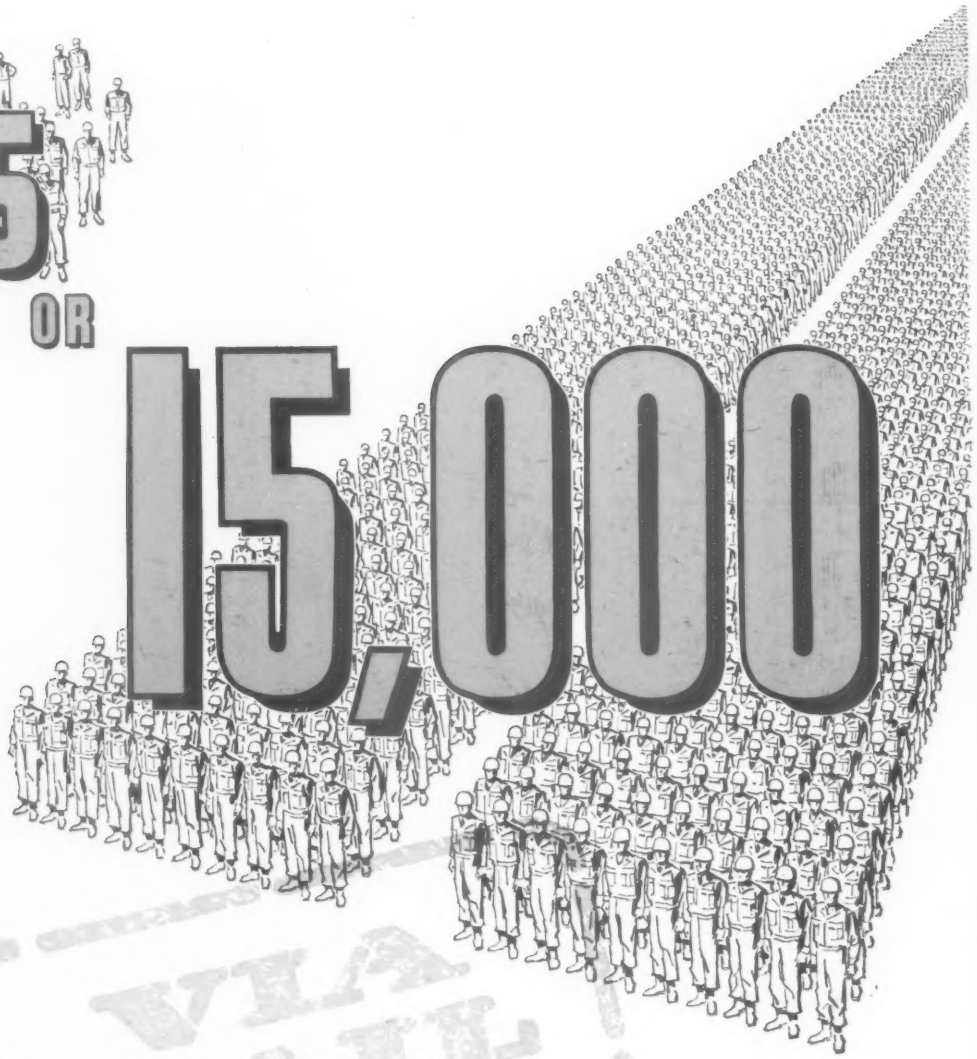


How the Army Uses Research And Development

Complete Contents P. 3



15 OR 15,000

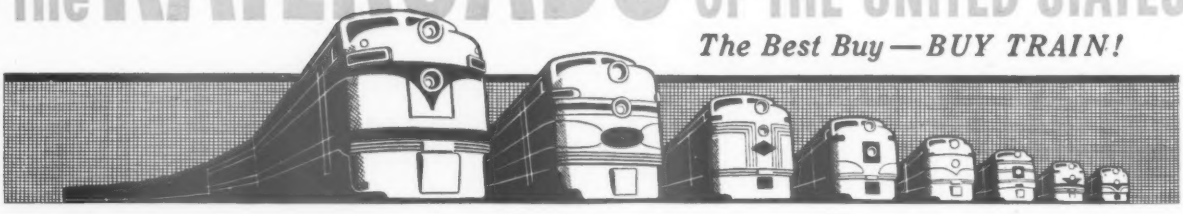


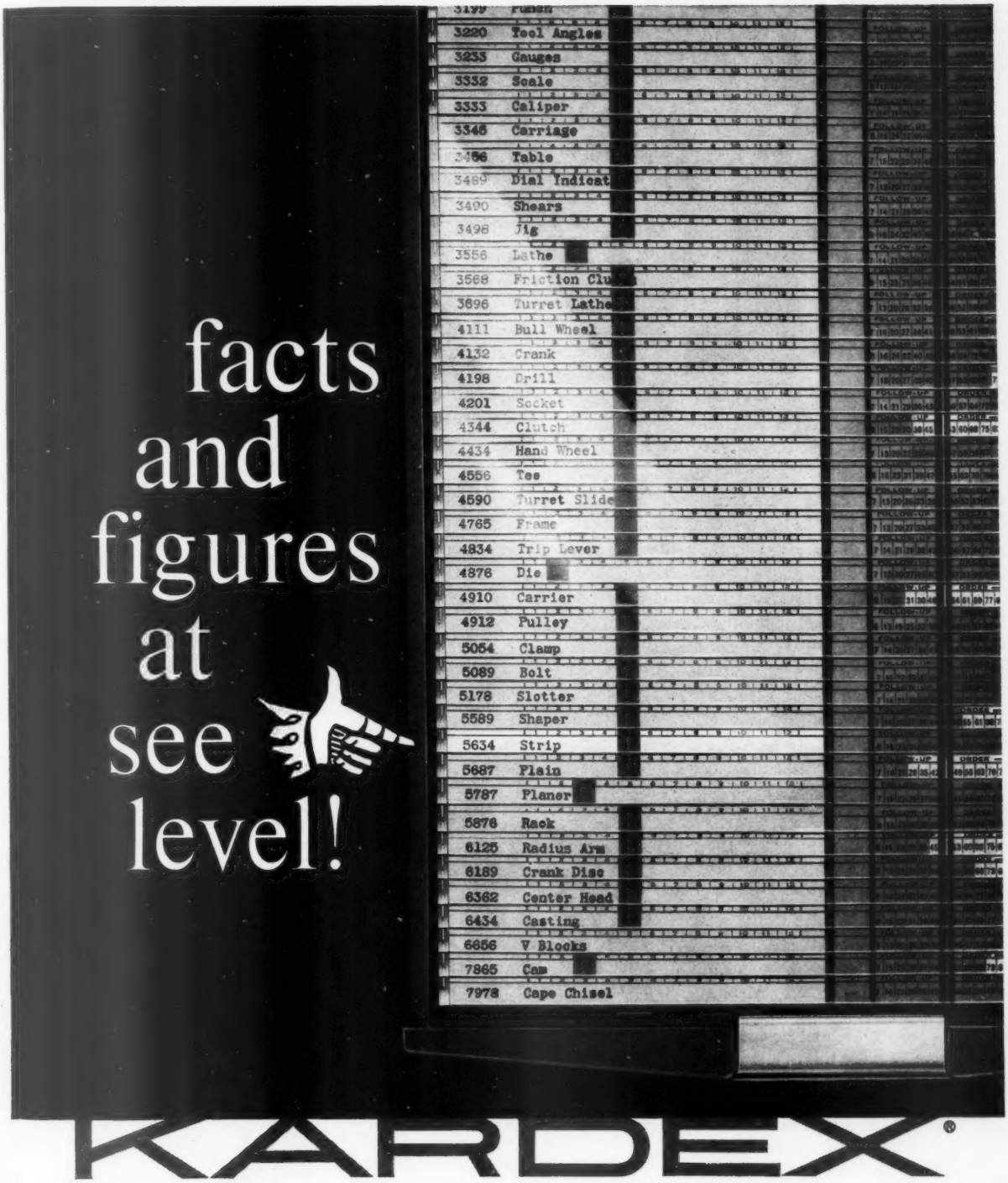
Regardless of size (and equipment) military units move best by rail. Train travel is comfortable, convenient and efficient. Troops, their baggage and impedimenta move together and arrive together at destination. Only the railroads are capable of providing complete transportation for any movement...anytime...any size...in any weather.

the RAILROADS OF THE UNITED STATES

Reduced fares when on leave
...special discounts on Transportation Requests
Ask about Family Fares

The Best Buy—BUY TRAIN!





KARDEX®

One of thousands of REMINGTON RAND® products and systems for the filing, finding, storing, housing, microfilming, protecting, controlling or photocopying of *records*. For the complete KARDEX story, write for free booklet to Remington Rand, Room 1428, 315 Fourth Avenue, New York 10, New York.

by Remington Rand
DIVISION OF SPERRY RAND CORPORATION

For more facts request No. 22 on reply card

Featured This Month

Lt. Gen. James M. Gavin

James Maurice Gavin was born in New York City, March 22, 1907. He enlisted in the Regular Army in April 1924, and served with the 16th and Second Coast Artillery Regiments until June 1925, advancing to the rank of corporal. In July 1925, he entered the United States Military Academy from which he was graduated and appointed second lieutenant, Infantry in 1929.

After three months as a flying cadet at Brooks Field, Texas, General Gavin joined the 25th Infantry at Camp Harry S. Jones, Arizona, in December 1929. In September 1932, he entered the Infantry School at Fort Benning, Georgia, graduating May 1933, and was assigned to the 38th Infantry at Fort Sill, Oklahoma, where he was transferred to the 29th Infantry in October 1933.

In the Normandy invasion June 5, 6, 1944, General Gavin commanded the parachute assault echelon of the 82nd Airborne Division which returned to England in July 1944, and he assumed command of it the following month. He commanded the 82nd in the airborne operation in the vicinity of Nijmegen, Holland, in the fall of 1944; in the Battle of the Bulge the following winter, and in the spring offensive of 1945, until the surrender of the German Army.

In March 1955, General Gavin was named Deputy Chief of Staff for Plans and Research, Department of the Army. On September 26, 1955, General Gavin was named Chief of Army Research and Development, Department of the Army.

Rear Admiral Joel D. Parks

Joel Dodson Parks was born on May 16, 1905 in Fayetteville, Tennessee, son of the late Joel D. and Emma W. (Puckett) Parks. He attended Lincoln County High School and Bryson College, both in Fayetteville, before his appointment to the U. S. Naval Academy, Annapolis, Maryland, from his native state in 1923. As a Midshipman he participated in class athletics; was a member of the Masqueraders and the staffs of the "Log" and "Lucky Bag." Graduated and commissioned Ensign in the Supply Corps, he subsequently attained the rank of Rear Admiral in 1954.

Following graduation from the Naval Academy in 1927, he joined the USS HOLLAND as Assistant

Supply Officer (one of the first supply officers assigned duty in connection with submarine spare parts). Detached from the HOLLAND in January 1929, he served until December 1931 as Assistant Accounting Officer and Assistant Supply Officer of the Navy Yard, Philadelphia, Pennsylvania. Completing a year's assignment in December 1932, as Assistant Supply Officer at the Navy Yard, Cavite, Philippine Islands, he joined the staff of Commander Destroyer Division FIFTEEN.

On June 30, 1954 he assumed the duties of Vice Chief of Naval Material, Navy Department, and served in that capacity until October 28, 1954, when he assumed duty as Deputy and Assistant Chief, Bureau of Supplies and Accounts.

Brig. Gen. Kurt Martin Landon, USAF

He attended the U.S. Military Academy at West Point and was graduated as a second lieutenant in the regular army on 12 June 1930. He entered flying training at Brooks Field, Texas, on September 12, 1930 ,and received his wings as a pilot on 10 October 1931.

He was assigned to the Army Air Corps and during the following eleven years he held various flying assignments including duties as pilot, airplane commander, aircraft section commander, engineering officer, flight instructor, training group commander, and as training and operations officer.

He was assigned to combat duty on 19 November 1944 and transferred to the Pacific Theater of Operations. He flew combat in B-29 type aircraft and was awarded three Bronze Stars while in the Asiatic-Pacific Theater. Upon his return to the ZI on 26 January 1946 he was assigned to the Eighth Air Force at McDill AFB, Florida.

From McDill, he was transferred on 6 October 1946 to Headquarters, Strategic Air Command, Ladd AFB, Alaska, as Wing Commander. He was then appointed as Chief of Staff, Headquarters, Yukon Air Division, Alaska.

On 25 June 1953, he assumed the duties of Chief of Staff, Headquarters, Air Research and Development Command, Baltimore, Maryland. On 12 February 1954 he was reassigned as Deputy Commander for Support Operations of ARDC. He assumed his present position of Deputy Commander for Resources, Air Research and Development Command on 1 August 1955.

ON THE COVER:

The Army's ace surface-to-air missile is shown ready to fire. Nike I and Nike B, operational defense weapons, guard against any airborne targets which may be encountered today or in the near future. Nike is generally dispersed around a number of important cities and industrial centers in this country. A newer version of Nike —Nike B—is under development by Army Ordnance and will have an anti-missile capability.

★

Editor
C. W. Borklund
Managing Editor
W. Walter VanStone
Associate Editor
M. H. Wicks
Financial Editor
W. Mac Stewart
New Products Editor
M. D. Forsyth
Art Director
William Tempelton
Advertising Manager
Bill N. Southworth
Book Reviews
D. D. Corrigan
Library and Research Editor
L. A. Thomas

★

Advertising Representatives
Los Angeles 28, California
Whaley Simpson Company
6608 Selma Ave.
HOllywood 3-7157
San Francisco 4, California
Whaley Simpson Company
55 New Montgomery Street
SUtter 1-6072
Chicago 2, Illinois
Dwight Early and Sons
100 North LaSalle Street
CEntral 6-2184
New York City, New York
Weston and Weston
6 East 39th Street
MUrrayhill 5-9450

ARMED FORCES Management

PUBLISHED FOR THE ARMY, NAVY, AIR FORCE, COAST GUARD AND MARINE CORPS

APRIL, 1957

page

Featured This Month 2
Short sketches of this month's featured military authors.

How the Army Uses Research and Development 5
Lt. Gen. James Gavin describes the Army system that has come up with such outstanding developments as Nike.

Six Ways to Build Morale 14
Rear Admiral Joel D. Parks outlines in short pointed paragraphs how to achieve the best tool in sound management—high morale.

How the Air Force Develops Research and Development Personnel 16
Brig. Gen. Kurt Landon tells why quality management personnel are important in R & D and how the Air Force builds them.

Research—Alternate Approach Method 24
In an exclusive interview, *Armed Forces Management* quizzes Clifton Foss, vice president of American Bosch Arma Corp., for his views on ARMA's different approach to development projects.

Can Brainstorming Improve Army Management? 26
Col. Frank Kowalski sets down a set of ground rules for one of the most exciting "Idea" developments in years.

How MATS Gets the Most Out of Its Airmen 50

DEPARTMENTS

Business and Finance 32
On Capitol Hill 36
Management Briefs from the Services 38
Professional Services 41
Washington Management 42
News of Armed Forces Management Assoc. 44
New Dollar-saving Products 45
Book Reviews 51
Index to Advertisers 54

★ ★ ★ ★ ★ ★

ARMED FORCES MANAGEMENT **Volume 3—No. 7**
Roy B. Southworth, Publisher

Published monthly by the Professional Services Publishing Company, Roy B. Southworth, President. Editorial and Business Office, 208 South Second Street, Rockford, Illinois. Printing office, 404 N. Wesley Ave., Mount Morris, Ill. Accepted as controlled circulation publication at Mount Morris, Illinois. Copyright 1957 by the Professional Services Publishing Company. Title registered, U.S. Patent Office. Six weeks' notice before next publication date required for change of address. SUBSCRIPTION RATE: One Year—$3.50; Two Years—$6.00; Three Years—$8.00. Single copy $.35—Bound Volumes $10.00.

EARLY TELETYPEWRITER

TELETYPE MODEL 28 PRINTER

50 years that changed the picture

The need for a reliable printing telegraph instrument that would provide a typed record of the message for both sender and receiver brought the company now known as the Teletype Corporation into the picture in 1907. From the halting performance of the original page printer to the smooth 100 words per minute of today's precision equipment has been a major step in communications.

But today Teletype equipment is often far more than a communication instrument. It is a basic element in production control systems . . . its ability to transmit and reproduce text and punched tape is harnessed to office automation . . . it provides a "conveyor system" for channeling complex raw data to a computing center thousands of miles away — and getting the answers back in a twinkling.

Indeed, Teletype machines have made many of the dreams of 1907 a daily part of today's business world. And the horizons widen daily as new dreams occupy our engineers and keep our laboratories humming.

If you would like a copy of our booklet, "The ABC's of Teletype Equipment," write to Teletype Corporation, Dept. AF-4, 4100 Fullerton Ave., Chicago 39, Illinois.

TELETYPE®

TELETYPE CORPORATION

Western Electric Company

How the Army Uses Research and Development

VAST AND radical changes are emerging in the development of the implements of war. The phenomenal technological advances of recent years have made available weapons of unprecedented lethality and destructiveness. To meet the challenge of these weapons the Army is rapidly evolving entirely new concepts of warfare. The creation of new weapons and tactical concepts has in turn stimulated increased demands for still more effective weapons and equipment. The Army is pursuing a boldly conceived, imaginative research and development program to provide the best arsenal of weapons that our technology can produce.

Research and development occupies a unique position in building the strength of the Army. It determines the character of materiel supplied and largely shapes the pattern of strategy and tactics. The Army's strategy and tactics can be superior to those of potential aggressors only to the extent that research and development provides more effective weapons. Improved weapons stem from scientific research and engineering development and can be achieved only by the close coupling of military requirements with the advancing frontiers of science and technology. The safety of the Nation may well depend upon how effectively the Army integrates science and technology into its research and development effort.

Army research and development is a complex enterprise. It involves the direction of vast business-type activities and the expenditure of large sums of money. It encompasses a spectrum of missions extending from the conduct of basic research in the physical sciences which might lead to the discovery of radically new weapons, to the effecting of minor engineering changes in conventional equipment. There are no fixed goals of accomplishment as such and the gains made cannot always be measured in the terms of dollars saved.

By Lt. Gen. James Gavin

Progress is gauged, rather, by the output from the effort expended and the output in turn has a direct bearing on the over-all combat-effectiveness of the Army. Since national survival is at stake, cost cannot always be a primary factor.

In large measure, the success of the Army's research and development effort depends upon how well it is planned, directed, and controlled. There probably is no other activity in the Army where the application of sound management principles and procedures is of greater importance. Economy in the use of manpower, materials and funds is essential if the Army is to maintain its lead in the technological race. Much thought and effort have been directed towards the organization and management of Army research and development along the same successful and economical lines employed in business and industry.

Organizing for research

One of the difficult problems faced in effectively supervising Army research and development has been the establishment of an adequate organization. The present organization, as shown in illustration on the next page, was established in 1955 and centralizes in one staff agency responsibilities and functions previously dispersed throughout the Army Staff. This organization provides a sound framework for the control, coordination, and integration of the Army program.

Significant organizational changes included the establishment of the position of Director of Research and Development with the status of an Assistant Secretary of the Army. He was assigned over-all responsibility for supervision of the program for the Secretary of the Army. On the military side, the Chief of Research and Development, with the status of a Deputy Chief of Staff, was assigned responsibility for planning, coordinating, and directing all Army research and development. He insures that the programs of the developing agencies are coordinated, that individually they are sound, and that collectively they constitute an effective program.

The Army Scientific Advisory Panel advises the Secretary of the Army, Chief of Staff, and Chief of Research and Development on scientific and related matters of concern to the Army. This panel is made up of some of the Nation's leading scientists and industrialists and helps bridge the gap between military requirements and technology. The creation of this panel constituted a significant step towards focusing the best scientific thinking and industrial experience on the solution of the Army's problems.

The primary developing agencies within the Army are the seven Technical Services. They conduct the actual development of hardware items, perfect techniques for their maintenance, and plan for their eventual procurement and supply. A majority of the work is executed by contract with industry, universities, or non-profit organizations. A portion of the research and development effort is performed within Army laboratories to maintain a level of competence for the effective qualitative control of contracts and to carry out such functions as requirements formulation, development planning, feasibility determination, testing and evaluation.

The Continental Army Command (CONARC) has responsibility for determining requirements for new or improved equipment to be used in the field army. This Command, with its six CONARC Boards, also performs user testing of the items developed for field army use. Additionally, it maintains a Combat Developments organization to insure that the doctrine and organization required for the use of new equipment is in phase with its availability.

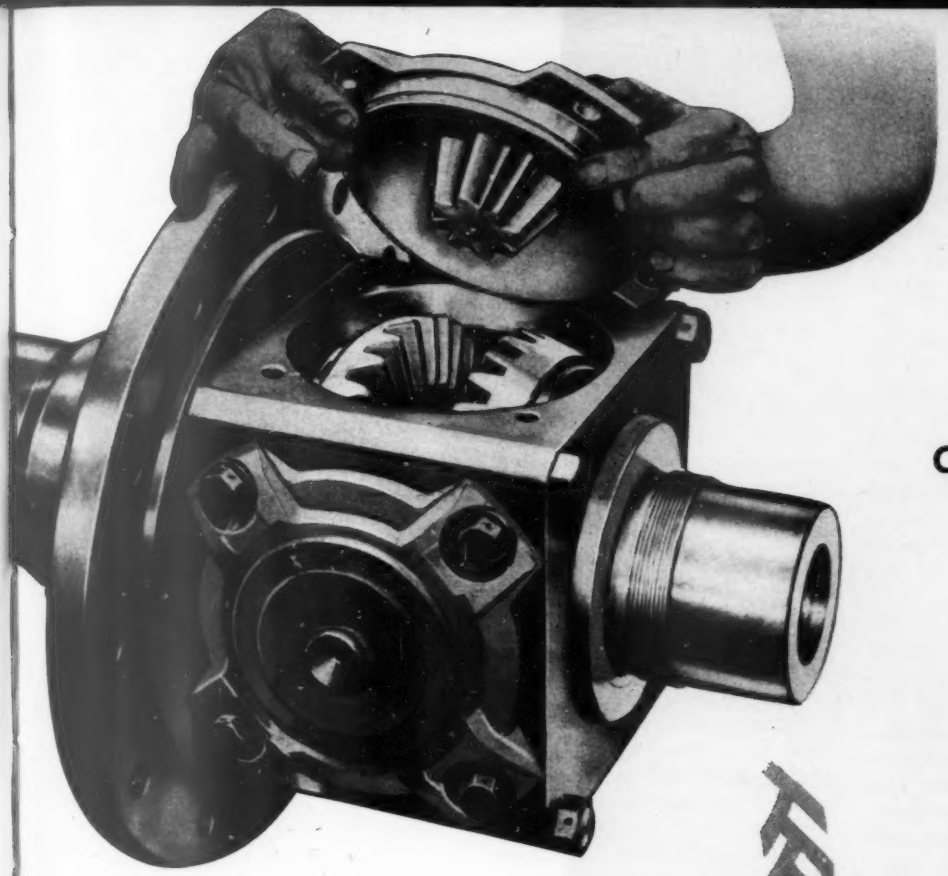
Getting the ideas

An understanding of development procedures will clarify somewhat the Army's functions in re-

Hauling through mud, sand, snow, or bombed-out areas, presents no obstacle to LeTourneau-Westinghouse haulers equipped with our exclusive, trouble-free power-transfer differential.

With more than 20,000 of these units in world-wide off-road service, our experience, and our engineering and manufacturing facilities, may be enlisted to your advantage in solving your hauler problems.

LeT



what this exclusive differential does

In area of overall good footing, LeTourneau-Westinghouse differential allocates power equally to both drive wheels.

When one wheel begins to slip, differential automatically transfers up to 4 times its power to wheel on firmer footing.

As slipping wheel starts to grip, power begins to equalize. On firm ground, both drive wheels pull evenly.

On a curve, differential automatically adjusts wheel speeds for smooth, sure control. There's balanced power on both wheels at all times, less tendency to skid on a fast turn.

With LeTourneau-Westinghouse differential, as soon as one wheel hits a slippery spot and tends to spin, idler pinions are forced outward against friction surfaces. This automatically slows the slipping wheel, and transfers up to 4 times its tractive effort to wheel on firmer footing. Neither wheel will spin independently until the 4 to 1 ratio is exceeded.

Simple, maintenance-free, this differential consists of only 6 moving parts . . . 2 differential gears splined to the final-drive pinions . . . 4 idler pinions inserted into bushings bolted to the differential housing.

When one wheel loses traction, pinions and bushings resist tendency to turn and keep power flowing to both wheels. Wheel with better traction continues to pull. Only when power need of one wheel is 4 times greater than that of the other do pinions turn in bushings and differential become a compensating unit.

This differential is standard on all sizes of LeTourneau-Westinghouse haulers. It has been thoroughly job-proved on thousands of installations all over the world.

Perhaps you would like to see how this differential performs in a typical LeTourneau-Westinghouse hauler. We shall be glad to arrange such a demonstration anywhere, anytime, at your convenience.

G-1391-ML

LeTourneau-WESTINGHOUSE Company

GOVERNMENT SALES DEPARTMENT, PEORIA, ILLINOIS, U.S.A.

A Subsidiary of Westinghouse Air Brake Company

Factories in Peoria, Illinois; Toccoa, Georgia; Indianapolis, Indiana; Sydney, Australia; and Campinas, Brazil.

Where quality is a habit

search and development. The R&D cycle begins with the conception of an idea and progresses through the requirement, development, user test, and final acceptance stages.

All research and development stems from the minds of inquisitive men, however, the Army cannot afford to wait for the random appearance of an idea whose application may have a significant impact upon military operations. Therefore, an intimate knowledge of significant advances in fundamental research is maintained through research contracts with scientific and academic institutions. The greatest number of practical ideas come from industry, CONARC and the various service schools. Ideas from private citizens are screened by the National Inventors' Council and the more promising ones are forwarded for consideration.

After receiving an idea, the potential using agency determines whether there is a need for the item and, if so, prepares military characteristics. These military characteristics are a concise statement of the qualities that the final item should possess and are used to guide the developing agency.

The military characteristics are submitted to the Army Staff with a recommendation that a development project be established. Data on the probable cost of developing the item, its cost in production, probable use of critical materiels, impact on the national productive capacity, and other data are assembled by the developing agency and forwarded to the Chief of Research and Development for consideration. If the requirement is deemed valid, the developing agency is directed to initiate the project.

Testing the ideas

In the development phase, prototypes are designed, constructed and tested, redesigned and retested until the developer considers he has a satisfactory item. At the completion of engineering tests of the prototypes, sufficient quantities of the items are procured to permit adequate user tests.

User tests are conducted, normally by CONARC Boards, on a limited number of the items under simulated field conditions. These tests determine the suitability of the item for performing its intended military use.

If the item is deemed satisfactory, the test agency forwards a report of test with a recommendation that the item be adopted. Army approval of this recommendation results in the item being accepted and placed in production for service use.

In cases of emergency, especially in wartime, it is sometimes necessary to accelerate procedures by telescoping or shortening some of the normal steps. "Crash" development and production is an attempt to buy time with money and can only be justified when there is a critical requirement for an item with minimum delay.

The Army research and development program is administered within the framework of the Army Program system. This system provides for systematic administrative staff procedures and an orderly method of conducting the Army's business. Management functions of the Chief of Research and Development are those of program development, program execution, and review and analysis.

Planning the development

Planning the research and development program is essentially a staff operation where professional military and scientific knowledge must be intermingled. The program is developed to achieve specific research and development objectives based upon approved requirements. It is directed towards the development of items and techniques that will significantly enhance the Army's mobility, firepower, and communications; provide a flexible and reliable supply system; and improve training, leadership, selection and utilization of personnel.

Controlling the development

Having established specific program objectives, the Chief of Research and Development prepares the Control Research and Development Program Document. This document, which presents a five-year phased schedule of development goals, is published annually and constitutes the basic guidance to the agencies concerned with the execution of the program. It contains the major objectives to be achieved, policies to be emphasized, and assigns research and development responsibilities. The objectives are related to specific research and development projects, subprojects or tasks which have been or will be initiated to fulfill the objectives. The document is also used as a basis for advance planning and as a yardstick against which progress is measured.

Using the information contained in the Control Program the devel-

Photo-copy Machine Saves Money

Fort Gordon, Ga. – Lightning struck twice at the Signal Corps Training Center here. Mrs. Mary Ellen Long, a native of Los Angeles, Calif., has received her second Suggestion Award Certificate in less than four months.

Col. Otto T. Saar, commandant of the Center's Southeastern Signal School, recently presented a $55 check to Mrs. Long for her suggestion to install a photo-copy machine which will save $1,250 the first year and $1,450 each succeeding year.

Mrs. Long is a clerk typist with the management branch of the Signal School. Her first Suggestion Award was presented in September, 1956. She was awarded a $90 check for suggesting the use of grease pencils on acetate charts rather than conventional charts. Adopted throughout the entire Training Center, this innovation will save approximately $3,000 a year.

The '57 DIAL*—all purpose "desk-top" copy maker

Copy Anything

with magic touch dial control

APĒCO DIAL-A-MATIC Auto-Stat®

Styled by Charles E. Jones & Assoc.

* **Just turn the dial —get a copy**

The dial is the secret of the world's easiest copying method. It automatically makes all adjustments to copy anything.

makes instant photocopies of anything written, printed, typed, drawn, or photographed—right in your own office.

Now get an exact photocopy of anything —in seconds. With the new all electric 1957 Apeco Dial-A-Matic Auto-Stat, you get clear, bright, sharp, black on white copies—and it's so easy. The magic touch dial control assures a perfect copy every time. Styled in polished, gleaming, stainless steel—the Apeco Auto-Stat is handsome, light weight, and compact. It copies any original up to 15" wide, any length or color on opaque or transparent paper—printed on one or both sides. It offers hundreds of money and time saving uses for every business. Priced well within the budget of even the smallest firm. Delivered with lifetime service guarantee.

Sales Offices in All Principal Cities

AM 47

American Photocopy Equipment Co.
1920 W. Peterson Ave., Chicago 26, Ill.
Rush me without obligation your new free book on the Apeco improved all-electric 1957 Dial-A-Matic, Auto-Stat plus the special report on how my business can use this modern copying method.

Company_____

Address_____

City_____ Zone____ State_____

Individual_____

Title_____

Type of Business_____

In Canada: Apeco of Canada Ltd., 134 Park Lawn Rd., Toronto, Ont.

TEAR OUT THIS CARD

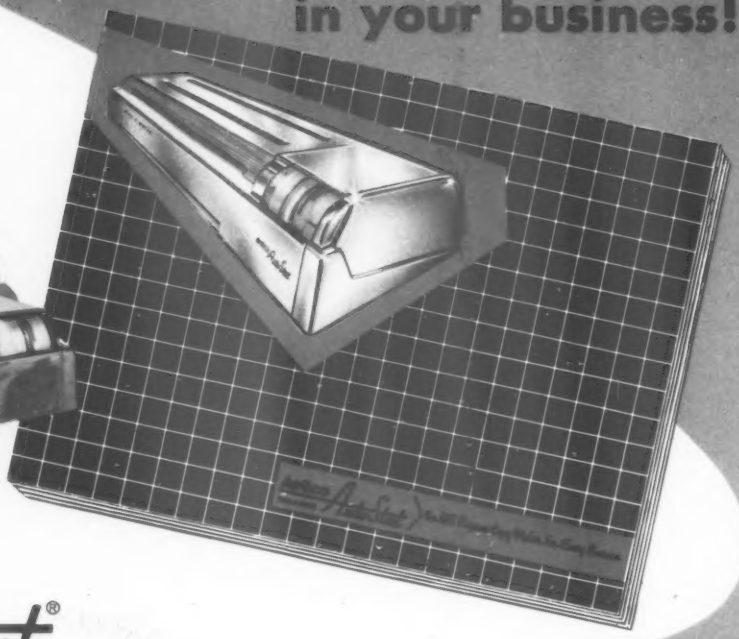
Mail this airmail postage-paid card for your

NEW FREE BOOK

Plus a special report on how your type of business uses Apeco Auto-Stat copying.

AMERICAN PHOTOCOPY EQUIPMENT CO.
CHICAGO 26, ILLINOIS

New FREE BOOK tells how you can use the APECO Auto-Stat in your business!



APĒCO Auto-Stat®
DIAL-A-MATIC

all-purpose "desk-top" copy maker

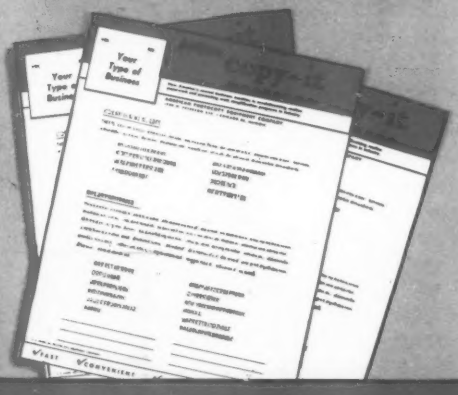
that belongs in your office

FIND OUT HOW you can save time and money by speeding production . . . by cutting costly office paperwork . . . by expediting shipping and receiving—and hundreds of other ways to increase the efficiency of your business with Apeco Auto-Stat copying. It's all in this new free book and special report. Send for your copy today.

Plus

a special report on how companies in your type of business use Apeco Auto-Stat copying!

These industry-by-industry reports are invaluable shortcuts to finding profitable uses for Apeco Auto-Stat copying, no matter what your business. They are the results of a department devoted to application research in every type of business and profession.



FIRST CLASS
Permit No. 26670
(Sec. 34.9 P.L. &R.)
Chicago 26, Ill.

Via Air Mail

BUSINESS REPLY CARD
No postage stamp necessary if mailed in the United States

5c postage will be paid by—

AMERICAN PHOTOCOPY EQUIPMENT CO.
1920 W. Peterson Ave.
Chicago 26, Ill.

Get your FREE BOOK and SPECIAL REPORT

TEAR OUT AND MAIL THIS POSTAGE-PAID AIRMAIL REPLY CARD TODAY

oping agencies prepare operating programs providing for the accomplishment of assigned objectives. These operating programs are then transmitted to subordinate echelons for action. In this manner, the entire Army research and development operation is tied together in a closely knit, coordinated effort.

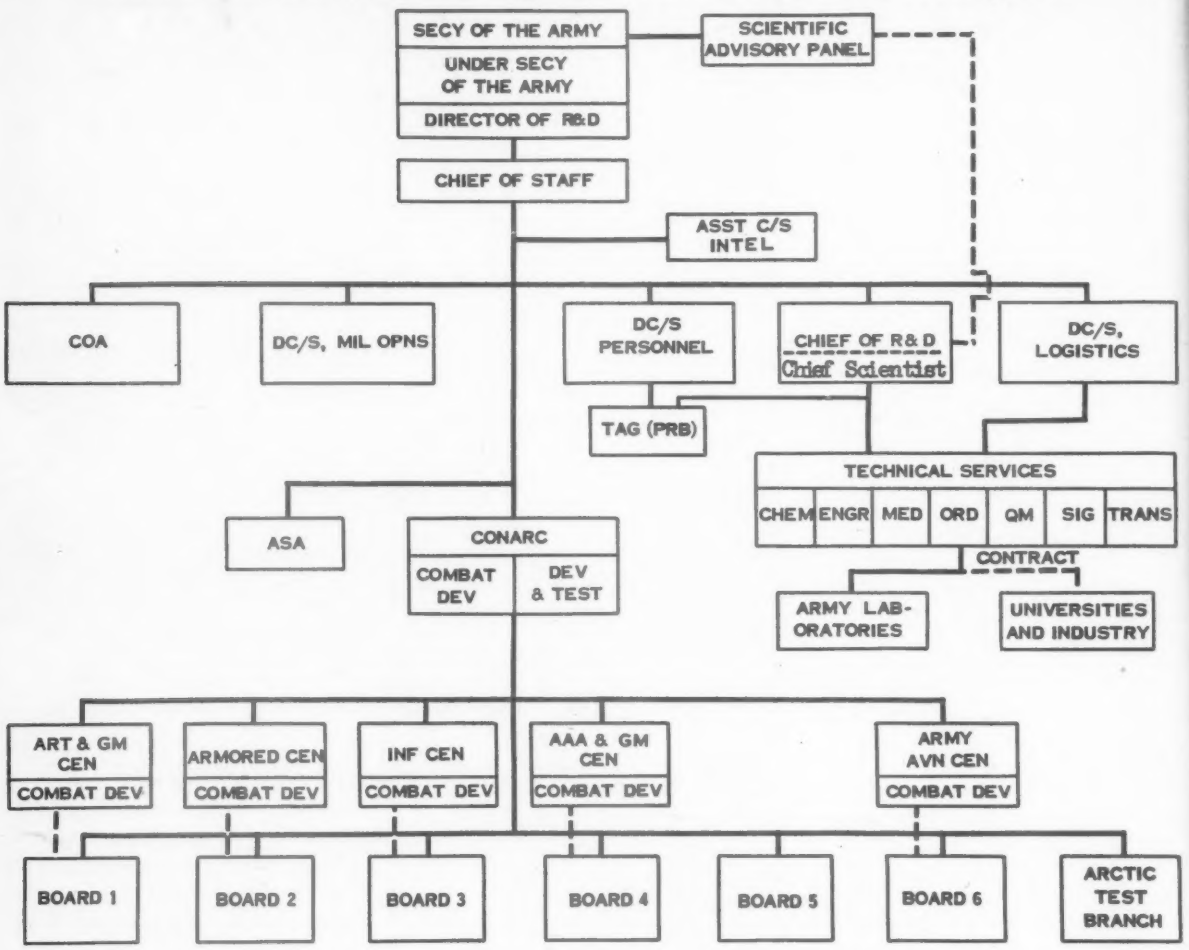
The budget is an expression of the research and development program in financial terms and, as such, plays a vital part in planning, programming, and management. Annually, the Department of Defense issues program-budget guidelines for the preparation of budget estimates. Based upon these guidelines and the needs of the Army, the Chief of Research and Development issues guidelines to the developing agencies and requires the submission of tentative programs. The Army R&D Review Board, which is composed of senior Army staff officers, reviews the programs to insure that they are integrated and adequate to support Army plans and are in consonance with Army and Department of Defense guidance. The programs are then translated into budgetary requirements for submission to the Army Budget Advisory Committee for review. After approval by the Chief of Staff and Secretary of the Army the budgetary requirements are then forwarded to the Department of Defense and the Bureau of the Budget for review and approval prior to formal submission to Congress. Upon appropriation of funds by Congress the program is executed.

Monitoring the development

With objectives and dollar limitations established for each project, the developing agencies become responsible for the execution of their segments of the program. Progress is monitored at both the developing agency and Army Staff level. This monitoring includes the surveillance and assessment of progress and the adjustment of requirements or emphasis as may be required. Many complex problems arise throughout the target year that require management attention. New knowledge from research may provide a basis for changes that

53,000 feet up
...on power by CAE
RYAN Q2 FIREBEE TARGET DRONE
J69-T-9 TURBO JET
J69-T-19A TURBO JET
MODEL 141 GAS TURBINE AIR COMPRESSOR
CAE power chalked up another record recently, when a Ryan XQ-2B Firebee jet target drone set unofficial world's records of 53,000 feet altitude and 104½ minutes of flight at Holloman Air Force Base.
The J69-T-19A is one of three gas turbines now in production at CAE. A second version, the J69-T-9, powers Cessna and Temco jet trainers for Air Force and Navy respectively, while the Model 141 air compressor is the heart of the TC-106 mobile starting unit for jet aircraft.
ENGINEERS!
There's a challenging future at CAE for qualified technicians. For full information, address: C. D. Morris, 1470 Algonquin Avenue, Detroit 15, Michigan.
CONTINENTAL AVIATION
CONTINENTAL AVIATION & ENGINEERING CORPORATION
12700 KERCHEVAL AVENUE, DETROIT 15, MICHIGAN
SUBSIDIARY OF CONTINENTAL MOTORS CORPORATION

Here's how the Army has organized for research and development



will improve or broaden the scope of a project. Anticipated scientific breakthroughs may not materialize as expected. Results of engineering tests may require reorientation of subsequent developmental action.

Frequently, it is found that changes in the funding level of effort are required. Developing agencies are given some latitude in reprogramming funds from one project to another. When progress of important projects is delayed due to insufficient funds and it is not feasible to reprogram funds from other projects, emergency funds can be requested from the Department of Defense. These additional funds must be strongly justified but, when obtained, permit acceleration of progress in key areas.

A means for detailed control of the research and development program is provided through the action of Technical Committees. The head of each Technical Service is required to establish a Technical Committee to effect coordination among the developing and using agencies during research and development, type classification, and procurement activities. Each Technical Committee acts in an advisory capacity to the Chief of the parent Technical Service and considers and reports upon such technical matters as may be referred to it.

Evaluating the development

Program review and analysis is that element of research and development programming which is concerned with an appraisal of the effectiveness of program execution. It includes the qualitative evaluation of programmed objectives, of the progress towards meeting these objectives, and of the effective, consistent and balanced use of programmed resources. It determines whether the goals established are being met and answers the question, "Are we doing what we plan to do and are we doing it as well as we should?"

Review and analysis is conducted on a continuing basis at all levels of command during the execution of the program.

The management techniques outlined above provide for a sound and effective research and development program. These techniques play a vital role in providing the Army commander in the field with the weapons he will require for success in combat. Management improvement is a dynamic rather than a static effort. Proud as the Army is of its management accomplishments to date, the real concern is not what has been done, but what it is possible to do. The future holds the promise of harder tasks, but greater accomplishments.

What does it do between

HERE and...

THERE?

For the first time the behavior pattern of a free space Moving Target can be directly calibrated and immediately evaluated!

The proof of any guided missile is its performance. Not only is it necessary to provide accurate trajectory data in order to determine its effectiveness, but this must be made immediately available.

To meet both requirements is the purpose of the AN/FPS-16 instrumentation radar. This is the first radar developed specifically for Range Instrumentation. It has demonstrated its ability to track with accuracy in darkness, through clouds—under any atmospheric conditions—over extended ranges, and to yield data that can be reduced almost instantaneously to final form. This unit can also be assigned to plot performance of missile, satellite, drone and other free space moving targets.

In the past, this data has depended upon optical devices, triangulation systems with long base lines and precision limitations, modified radar equipment and data reduction methods often requiring months for computation. The immediate availability of data evaluation provided by the AN/FPS-16, now being built by RCA under cognizance of the Navy Bureau of Aeronautics for all services, is a great forward step in Range Instrumentation.

Defense Electronic Products

RADIO CORPORATION of AMERICA

Camden, N.J.

Tmk(s) ®

Six Ways to Build Morale . . .

THE MANAGEMENT group of any civilian or military operation provides the hard core of professionals around which we build our organizations. And nothing is more vital to sound management operation than high employee morale.

1. I think the paramount contribution to high morale is "pride in the outfit." Everyone needs to think that his job is important. He needs to feel that his efforts are necessary to the nation and to the organization. He must, therefore, be made aware of the importance of the unit in which he serves. To this end information passed out as to accomplishment of the unit and its importance is a tremendous boost to employee morale.

There have been many criticisms of the Navy's use of "spit and polish." However, in my opinion, these criticisms are unjustified. First, appearances in any command are important. Employees take a great deal of pride in their surroundings. Therefore, the use of employee suggestions in improvement in appearances of the command should be encouraged. Where I have had command of Naval supply depots, I have tried to engender a spirit among my people that this is the best depot in the Navy and the Navy is second to no Armed Force in the world. So must it be in any organization. A sincere pride in the outfit must be the goal for every supervisor for all employees under his supervision.

2. Secondly, I want to talk about personal leadership of the unit supervisor. In the military it was found on the hard school of the battle field that the crack outfits were those commanded by men who had devoted meticulous attention to the personal welfare, comfort, and equipment of the individuals under their command. So in a sense it must be in the unit supervisor for those under his supervision. He must know the individual strength and weaknesses of his subordinates. He should know their hobbies and interests, their family troubles and joys. He must be a counselor as well as a trainer, a fierce partisan for his subordinates before higher authority, but able to maintain discipline within his unit. Above all, he should be able to hand out praise and encouragement as well as criticism. In other words he should be a leader rather than a driver.

3. The third building block in building this structure of morale I call defining the objective. American people are perculiar in one respect. They like to know what they are doing and why. The employee to be interested in what he is doing must know that his job is useful, productive and has a definite meaning. In totalitarian countries, I am told, it is possible to induce people to achieve their tasks by simply telling them what to do and the employee is supposed to be able to carry out his task efficiently.

However, in our nation we encourage people to *think* and to improve the processes upon which they are working. The entire history of American progress is built on suggestions and improvements made by the workers. Therefore, a little time taken by the supervisor to explain the purpose behind an assignment will pay big dividends in enthusiasm and will to work of the subordinates. In other words, tell them what they have to do, and why it must be accomplished and encourage them to find an easier way to do it.

4. The fourth element in the building of morale I call recognition of the individual. Psychologists and industrial relations research specialists say that not material benefits but personal recognition is the dominant factor in job satisfaction. In other words, it is more satisfying to have a job that makes you feel important than to have a job paying a lot more money with a less feeling of importance. To illustrate, take the amateur athlete. I think you will admit no one strives harder to win than he. Is it money he wants? No. He cannot and will not accept 1c for his endeavors. Is it shorter hours? No. In general, he wants to play the whole game and will be very much disappointed if his hours in the game are curtailed. Is it security? No. He would be the first to suggest that, if a better man were in the squad, he should be put in the line-up instead of himself. The answer as to what makes the amateur athlete strive to win is *the incentive to excel* in the game and to *receive recognition* for his efforts.

So it is more or less with the people who work for you. They want personal recognition for their efforts. Top supervisors should be quick to recognize the achievements of minor employees and subordinate unit supervisors, and they must be alert to bring to higher authority notice of superior accomplishments of their subordinates for public recognition.

5. The fifth element in the building of morale I call supervision and the Golden Rule. An officer once worked for me who professed complete ignorance of the Navy Regulations. Furthermore, he told me he had no intention of reading them. I was somewhat astounded at this and asked him how he proposed to carry out his assignments. He stated to me that anybody who kept the

In Brief...

1. The basic element which a supervisor can contribute to morale is pride in the outfit.
2. Leadership of the supervisor must be personal, not merely technical or critical.
3. The supervisor must be able to show the subordinates where they are going and why.
4. Personal recognition of achievements of subordinates will gain their loyalty and cooperation.
5. The supervisor must remember in his dealings with subordinates that the Golden Rule is one of the best rules of the road.
6. Enthusiasm for the job must be engendered by personal example and not by edict or command.

by Rear Admiral Joel D. Parks, SC, USN
Commanding Officer
Naval Supply Center
Pearl Harbor, T.H.

Ten Commandments and lived by the Golden Rule had little use for the Navy Regulations. I couldn't go quite so far as agreeing with him, but there was a lot in what he said. Laws and regulations are made for regulating the conduct of people and nations, but there would be little use for all these laws if everyone lived by the Golden Rule. For example, good manners and good sportsmanship are nothing more than an extension of the Golden Rule.

In giving an order you should put yourself in the other fellow's place and judge the order not on the basis of whether you would receive pleasure in carrying it out but whether, if you were on the receiving end, you would consider the order just and reasonable. Intelligence, industry, initiative, and ambition are marks of the competent supervisor. However, there is another element upon which depends the success or failure of the operations of the unit and that is humanity.

6. The sixth element in building morale is called enthusiasm for the job. To build enthusiasm for the job to be done by his subordinates a supervisor must do it personally. He can neither delegate it nor mechanize it. Interest in and enthusiasm for the job are contagious, but this contagion can only be spread by personal contact. The flame of enthusiasm must be fanned by hand. The simple elemental facts are we are dealing with people and American people respond dramatically to inspired leadership.

The material aspects of morale—pay, working conditions, leave, etc., are important but not all-important. Perhaps what we need is a definition of morale. In the words of Admiral Carney, "Perhaps 'morale' means different things to different people.

"Is high morale merely a state of vacuous happiness engendered by a placid and problem-free existence, or is it a proud, tough frame of mind conditioned to overcome troubles and obstacles? Is morale a fragile plant that wilts with the first cloud or the first chill wind? Or is it a rugged and resilient tree that bends to the gale but holds firmly and snaps back?

"There can be but one answer to those questions.

"Morale is that spiritual quality which causes a man to rise above danger, reverses, and even boredom."

What the supervisor and top management can contribute to morale is much more important than material benefits. They can contribute intelligence, understanding enthusiasm, and above all —leadership.

Air Force Orders Sperry Radar Sets

Sperry Gyroscope Company of Great Neck, New York, has been awarded an Air Force contract for $2,727,517, according to the Air Materiel Command.

This latest contract for APN-59 radar sets provides for additional quantities beyond those included in a recent six million dollar award by USAF for the same type of radars. Believed to be the smallest and lightest for its size and range, the equipment was developed jointly over many years by the Air Force and Sperry. The system performs precise, varied functions of search and surveillance, storm detection and other all-weather navigation procedures, and has been ordered in great numbers for use in the Air Force's troop and cargo-carrying transports.

New Compass Guides High-Speed Bombers

Washington (AFPS) — A new, revolutionary "astro" compass to guide high-speed bombers to long-range strategic targets with greater accuracy is being produced for the Air Force.

The compass, which automatically tracks celestial bodies and computes precise aircraft direction, is being built by the Kollsmann Instrument Corp., Elmhurst, N.Y. under a $26 million contract with the Air Research and Development Command.

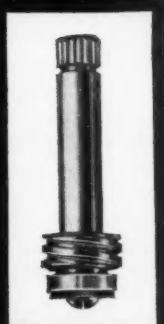
FEATURE	SIG	2	3	4	FEATURE	SIG	2	3	4
1. Locking signal	Y				9. Accurate analysis locked signalling	Y			
2. Easily moved signal	Y				10. Pocket with wire and acetate lug	Y	Y		Y
3. Protected pocket	Y	Y	Y	Y	11. Pocket lug riding on rail	Y			
4. Pocket tight to lug	Y	Y	Y	Y	12. Frictionless shift of pockets	Y			
5. Positive visibility	Y				13. Perfect layback of pockets	Y	Y		
6. Ease of insertion	Y				14. Roller suspension slide	Y			
7. Quality	Y				15. Group shifting of pockets	Y			
8. Price	Y				16. Greatest card capacity	Y			

Effective Tools for Effective Management

WASSELL ORGANIZATION, INC.
Westport, Conn.

IN USE IN ALL BRANCHES OF GOVERNMENT
WRITE FOR NEW BOOKLET "SIG-NA-LOK"
OR
Consult our GSA Federal Supply Service Contract Class 54—Part 111—Sec. B—Cont. No. GS-OOS-3072 GSA Distribution Code 78 & 79 Item No's 54-1-675 and 2325

For more facts request No. 25 on reply card



$AVE DOLLAR$
Replace with BELCO BALL BEARING STEMS
10 YEAR TROUBLE-FREE OPERATION
Write for full particulars or send sample stem

BELCO DIV., MILLER MFG. CO.
17638 Grand River Ave., Detroit 27, Mich.

For more facts request No. 16 on reply card

ARDC Photos by A/IC L. C. Shannon

Continuous Training—Staff/Sergeant M. A. Scheaffer, Lt. Colonel J. M. Burkness, and Colonel F. W. Searles of the Military Training Division, Headquarters ARDC discussing the impact on ARDC of the recommendations of the USAF Education Conference.

Program Planning—Communications between the Deputy Commander/Resources and staff members of the Directorate of Personnel are continual. Shown here after discussing the overall ARDC Personnel Programs are M. Kesner and R. H. Hardin of the Plans and Policy Division, Colonel Arnold L. Smith, Director of Personnel, and Brigadier General K. W. Landon, Deputy Commander/Resources, Headquarters ARDC.

Military
B. Koeni
Division,
requirem
dates,
"Square

How the Air Force Develop Res

THE SOVIET military challenge to the United States and her allies makes it quite clear that technological superiority is a key factor to our national survival as well as that of our allies. Essential to this superiority in today's increasingly mechanized world is the quality and quantity of skilled technical manpower. The attention being given to our technical manpower supply by scientific societies and study groups of eminent citizens attests to the great significance this problem has assumed.

The national defense program is a major user of scientific and engineering talent. This includes the personnel employed by government contractors and military and civilian agencies. Within the Air Force, the management of the vast research and development program is entrusted to the Air Research and Development Command. To perform this function requires the combined management, scientific, engineering, and supporting talents of about 41,000 military and civilian employees. These people are located at Headquarters ARDC, the 10 ARDC centers, and many field activities located throughout the country and Europe.

by Brigadier General Kurt M. Landon
Deputy Commander, Resources
Air Research and Development Command

The impact of the total military research and development program on the operations of the Government is much greater than is indicated by the proportion of the budget it absorbs. The impact affects greatly the nature of our current industrial economy and constitutes an immense workload for several major industries.

Because of this great impact the quality of the management of the Air Force R&D program is of incalculable importance to the nation. The management and technical problems involved are great; therefore it is vital that highly-qualified people be secured, motivated, retained, and recognized for this responsibility. The personnel programs which have been considered and developed since the establishment of ARDC are therefore of great significance.

As discussed in the article in a recent issue of AFM,[1] ARDC directs much of its prime mission through contracts with universities, research foundations, and industrial organizations. Consequently, ARDC's technical people influence the technical products developed by these organizations. Accomplishing this mission requires both military and civilian administrators and specialists who must:

—Have the technical know-how necessary for planning, programming, evaluating, and making staff decisions.

—Speak the language of the industrial and university scientists and engineers who do most of ARDC's research and development work.

—Motivate work in areas not being sufficiently developed and exploited for military needs.

—Bring up-to-date weapons doctrines for employment in the development process of new or improved weapons.

—Bring the best operational flying know-how into the R&D complex of research, development, and testing.

—Perform direct scientific and engineering duties in connection with ARDC's own research and development program.

—Bring in the combined military-technical background and viewpoint necessary in R&D of weapon systems.

—Perform as knowledgeable, capable, and skilled managers and executives for R&D administration.

The Overall Plan—

Overall Air Force personnel

[1]Power, Thomas S., "Managing the Air Force Research and Development Program," Armed Force Management, Vol. 2, (Dec. 1955), pp. 5-10.

ARDC Photos by A/1C L. C. Shannon

Military Selection—Major W. P. Sheridan, Lt. Col. S. B. Koenig, and Major N. Stern of the Military Personnel Division, Headquarters ARDC, review technical officer requirements and the records of the most qualified candidates, identified through machine selection. (Project "Square peg").

Civilian Development—Staff assistance is a continuing program in ARDC. Shown discussing elements of the ARDC Civilian Career Development Program are E. J. Perret, Chief, Civilian Personnel, RADC; Lt. B. E. Nagel, Chief Training Division, AFAC; Mr. C. W. King, Chief, Civilian Personnel, Headquarters ARDC; Miss R. Hoy, Classification Branch, Headquarters ARDC; and R. R. Anderson, Career and Professional Development Division, Headquarters, ARDC.

opResearch and Development Personnel

policies and management practices frequently do not adequately treat personnel operations that concern special and highly technical activities such as those performed by this command. Thus, as the Air Force has become more technical in several of its missions, much thought has been given to what the nature of research and development requires for effective management. Since 1949 there have been three select study groups (Ridenour Committee, Air University Study, and the Second Hoover Commission) which studied basic aspects of research and development management. A comparison of the recommendations of each group reflects overall agreement—even to the acceptance of many details. These survey reports have become the basis for far-reaching developments in the ARDC personnel program and for administration of research and development organizations. Significant advances have already been made in adapting these recommendations to the Air Force mission, particularly with special reference to the managerial and personnel needs of ARDC.

ARDC's centers have some of the most up-to-date technical facilities in existence for their purpose. Some of them are unequalled and offer challenging job experiences. Many technological requirements of our work dictate that we must operate in isolated parts of the country. Naturally, isolation creates related personnel problems: Lack of sufficient facilities such as housing, schools, churches, shopping facilities, and other required community facilities. Thus the isolation of our centers aggravates the already severe problem of recruiting and retaining qualified personnel.

Necessarily, security restrictions hamper our people in establishing national professional reputations and in publishing scientific papers for distribution to the nation's scientific community.

The present dependency of the nation on scientific personnel invokes the necessity for conserving present resources for such personnel and to develop additional resources. It is within this framework that the ARDC personnel function (Military Personnel, Civilian Personnel, Training, and Ground Safety) is discussed.

Handling Military Personnel

In the complex field of military personnel management, made up as it is of assorted activities, there is often a temptation to deal with a specific problem as if it were unrelated to the long range goal to be attained. In the development of the parts of the ARDC military personnel program, we have made every effort to assure that each part is related to the whole Air Force program and is pointed toward our ultimate objective.

Stabilized Tours. Throughout the Air Force the rotation of officers is a source of management instability. The Air Force has, however, established a stabilized tour of from three to five years for research and development officers. The policy promotes maintenance of technical and management skills and continuity on technical projects.

For all its officers, the command has taken steps to insure greater stability. Based on a desired minimum three-year tour for all officers, action is taken to make no reassignments which do not provide for desired stability unless no other approach is available to satisfy a military requirement. This policy is calculated to maintain high morale among ARDC officers.

Reassignment. It may sound incongruous to speak of stability of personnel and then consider a policy for the rotation of R&D officers. In order to avoid undue technical officer rotation, yet at the same time assure that these officers are provided with current military experience outside R&D through carefully selected assignments, a plan was evolved. After insuring the stability of our R&D

personnel for the competion of their first three-year minimum tour, a reporting procedure was established to review the records of those R&D officers becoming eligible for reassignment. Reports contain release dates, as established by ARDC center commanders and Headquarters ARDC staff agencies, which will least interfere with the project to which the officer is assigned. This report encourages advance planning and accurate job matching for these officers to allow more effective utilization of their experience and potential in jobs that will develop further their R&D careers and enhance their management potential.

Project "Square Peg." In February 1956, a program aimed at the development of a system for better matching of men and jobs was initiated. A highly mechanized system of this type was considered necessary in order to facilitate the filling of research and development jobs with capable and knowledgeable officers and to add another link in ARDC's effort to utilize effectively its human resources. Significant benefits immediately attained were more information concerning the actual requirements of R&D jobs and the listing of potentially qualified personnel for specific R&D jobs.

In addition to its use within ARDC, Headquarters USAF utilizes this system in the assignment of R&D officers to this command. The program has great potential in terms of improvement of the kinds of jobs to which officers are assigned, improvement in the military job classification system, determination of training needs, and long-range career planning.

Qualitative Manning. Rank in the organization is an effective qualitative measurement. As officers gain higher rank they are exposed to operating situations and conditions which make them more mature, and self-reliant, and better qualified.

Within ARDC we have a shortage of majors, lieutenant colonels, and colonels with a concurrent overage of lieutenants. A procedure has been established to assign officers throughout ARDC on an equitable basis insofar as grade is concerned. Every effort has been made to give each activity, within ARDC, its proportionate share of officers by grade, thus providing more equitable distribution of experienced, mature officers. Without such specific controls, wide discrepancies in the distribution of quality as evidenced by rank would occur.

Handling Civilian Personnel

While junior officer procurement is facilitated by the requirement that each young man perform his military service obligation, ARDC has no such advantage in the recruitment and retention of civilian personnel. For the latter we are in direct competition with all others who rely on the civilian labor market.

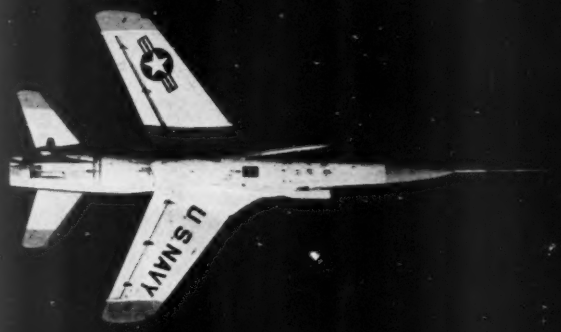
Like any other activity of a complex and technical nature, we could, of course, use many more highly qualified civilian engineers and scientists. Despite the fact that Government salary limitations, competition with industry, and the nationwide shortage of engineering and scientific personnel handicap our ability to attract a properly balanced civilian work force, we are proud of our retention of most of the personnel we have. How is this done? Basically because we give our people challenging jobs and have them work on new ideas in excellent technical facilities. In addition, ways and means have been formulated and implemented to provide for more effective recruiting, utilization, development, and retention of civilian personnel. Of particular significance are several of the programs described below.

Civilian Development. During the past few years both Government and industry have recognized the need for systematically developing employees for present or future responsibilities. It has been recognized that the primary answer is to develop present employees to their maximum potential rather than to try to compete for the very limited number of well-qualified administrative and technical personnel. Keeping in mind that ARDC is engaged in a large scale technical and management operation which is a big workload for the total economy, we must do certain things for our employees. Among our special personnel programs ARDC has recently instituted a career development plan for civilian, technical and management employees which combines appraisal, individual development, and skills inventory to maximize the utilization of employee potential.

High School Program. To spark the interest of outstanding high school students in scientific, engineering, and mathematical studies, a program was initiated last summer at the Air Force Missile Test Center. The results of this trial were so favorable that the program is being expanded to other ARDC centers as practicable. In the Missile Test Center program high school students are selected and given summer employment at the center. During this period an opportunity is provided for the student to meet persons and see activities associated with the fields of engineering, science, or mathematics. The trial summer program has stimulated further student interest and received favorable press and public reaction.

Experimental Personnel. At Rome Air Development Center, ARDC, an Experimental Civilian Personnel System was effected in which all levels of management are responsible for active participation in civilian personnel management. The system uses committees composed of civilian chiefs from various levels of top management. Each committee considers qualifications, organization, classification, utilization, and performance of incumbents. Promotions of scientific and professional employees are recommended on the basis of achievements. The major advantages of this plan are improvement of management through better communications, participation of all levels of management in the civilian personnel management, improvement of working relationships between personnel technicians and operating officials, and better personnel service.

College Recruiting. ARDC employs about 4,800 professional civilian employees who are engaged in scientific and engineering duties.



Unofficially, the new Grumman F11F-1F Tiger has topped the world high altitude record and exceeded the world speed record. More important, the F11F-1F has unsurpassed maneuverability at extremely high altitude and excellent handling characteristics for its very high Mach number capabilities. This, plus its ability to operate from carriers and small airfields, qualifies the F11F-1F as the world's best air superiority fighter.

GRUMMAN AIRCRAFT ENGINEERING CORPORATION

BETHPAGE · LONG ISLAND · NEW YORK

Designers and builders also of the supersonic F11F-1 Tiger, transonic F9F-8 Cougar jet fighter, F9F-8T Cougar fighter-trainer, F9F-8P Cougar photo-reconnaissance, S2F anti-submarine Tracker, TF Trader carrier-transport, WF-2 early warning Tracer, SA-16B Albatross rescue amphibian, Grumman boats and Aerobilt Truck Bodies.

Since about 14 per cent of these employees leave the command each year, it is necessary to seek and recruit about 700 replacements.

The difficulty in replacing these well-educated and highly trained employees is caused by several complex factors: The high degree of required specialization in our scientific and professional personnel; the nation-wide shortage of such people; and the geographical remoteness of our centers from the widely separated labor markets which produce the different specialties in qualified personnel.

The importance of the college recruitment program, which is basic in providing ARDC with a continuing resource for many scientific and professional employees, is well established. This ARDC program has achieved considerable success and recognition in establishing favorable relationships with universities and in the quality and quantity of engineers and scientists obtained directly upon graduation.

Training Personnel

At ARDC headquarters major programs to promote greater scientific and technical knowledge are being rapidly advanced. These range from a Resident Graduate Center Program which provides key personnel, both military and civilian, with opportunities for advanced study to Factory Training for airmen and civilians which develops new highly technical skills for the operation and maintenance of Air Force equipment during test activities. Much of the Air Force technical capability is attributable to wise management and legislative policies with respect to training developed since World War II.

On-Base Program. The ARDC graduate study program has proved to be of enormous value in providing our technicians, engineers, and scientists—military and civilian—without cost to the individual, a convenient opportunity for advanced studies to keep them abreast of technological progress in their fields. Conducted through contracts with many leading universities, utilizing facilities of the centers, the program furthers employee knowledge with a positive accent on areas of technical value to the Air Force. Whenever practicable, arrangements are made with contracting universities to grant employees credits toward advanced degrees for the courses offered.

USAFIT Program. Professional development of ARDC officers is advanced by fulltime undergraduate and graduate programs conducted, or sponsored, by the Air University command. Each year selected officers attend these courses given at several universities and at the Air Force Institute of Technology.

Short Courses. There has arisen an increasing requirement for a limited number of high-level academic courses for bringing up-to-date knowledge of the latest "*state of the art*" advancements. These are known as the "Short Courses." While most of the advanced courses are among those regularly offered, several educational institutions and professional laboratories have established various kinds of "short courses" to meet the specific needs of ARDC. Examples include such courses as "Radioisotope Techniques" at Oak Ridge Institute of Nuclear Studies; "Nuclear Reactors and Radiation" at the University of Michigan; "Automatic Control of Aircraft" at the Massachusetts Institute of Technology; and "Parachute Engineering" at Purdue University.

Civilian Off-Base Training. For the first time in U.S. Air Force history, it is now possible for a limited number of civilian scientists and engineers to attend universities on a full-time basis with full pay to meet an established need for knowledge and techniques in highly specialized subjects associated with their assigned projects. This program has been in existence since September 1, 1956. Fields of specialized study include electronics, nuclear physics, special problems in meteorology and other highly-specialized and technical subjects. Generally such studies are conducted at the doctorate or post-doctorate level.

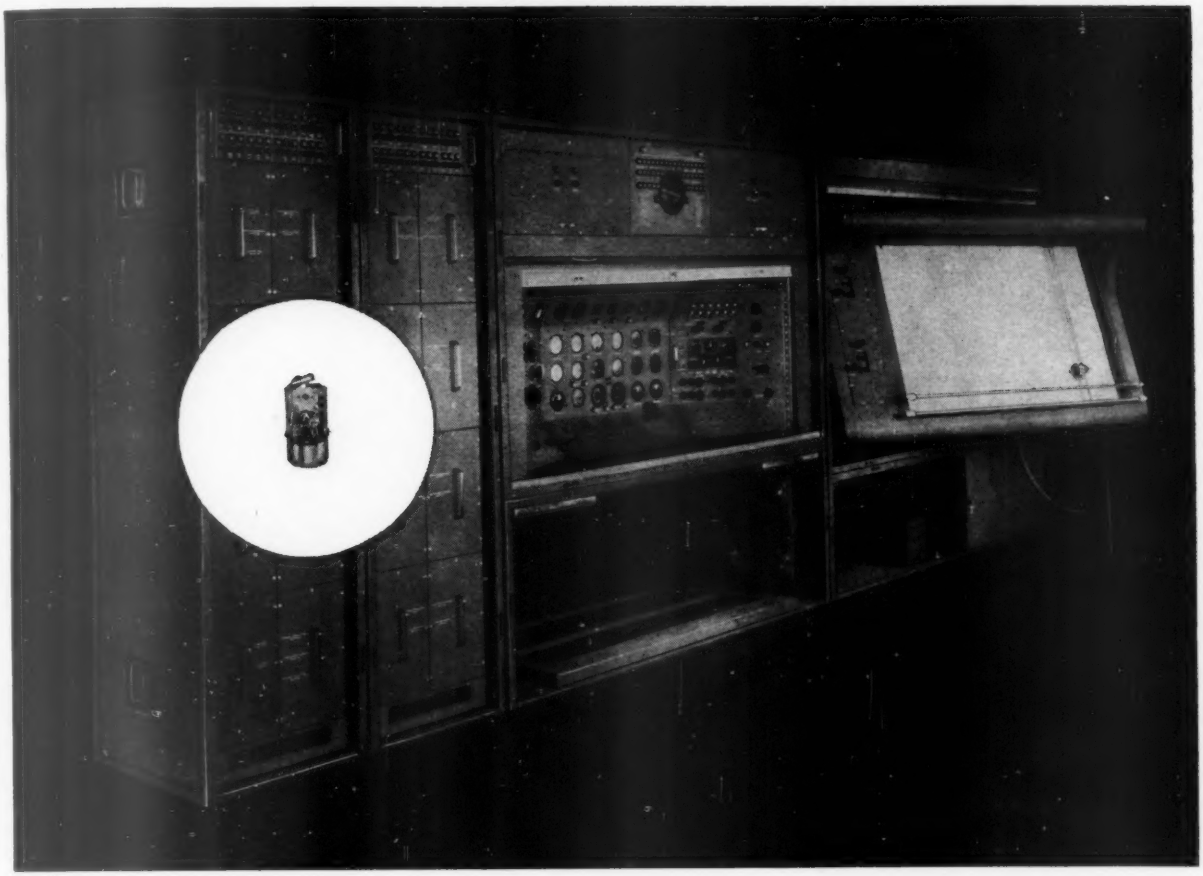
Ten Year Officer Program. In order to program training at civilian institutions on a longer range basis, ARDC has recommended a 10-year officer education program to Headquarters USAF. It involves the allocation of 1,000 spaces per year to education and training of officers. Experience through the years has shown that approximately 60 per cent of all requirements per year exists in the research and development specialties. Provision has been made for an annual review of the ten-year program to keep pace with technological progress.

Fellowships. Since 1954, military and civilian personnel of ARDC have taken part in the Sloan Fellowship program in executive development conducted by the Massachusetts Institute of Technology. This is a program for developing top management potentials. To qualify for the one-year program, an individual must be evaluated by his superior as a future leader. He must possess excellent qualities of leadership, sound management sense and from five to ten years of experience in a supervisory capacity. ARDC personnel are also nominated for the Rockefeller Awards, Guggenheim Fellowships, National War College and the Industrial College of the Armed Forces.

Factory Training. Factory training is an integral aspect of our total training program. This training, conducted at the plants of Air Force contractors, is vital because our people must operate and maintain new equipment while it is being tested or undergoing further development. Because no other capability for this training exists, this training preserves the investment of the Air Force in the costly prototype and initial production types of equipment. Such equipment is used by ARDC many months in advance of its acceptance in the Air Force inventory.

Increased complexity of new developments in supersonic aircraft and guided missiles now entering test phases in increasingly large numbers, has among other things, meant more and longer training courses and increased costs. While this training has become expensive, it is insignificant in terms of wastage that would result if these developments were forced to stand idle to await training of personnel, or worst yet, put into the hands of unskilled personnel.

Management Training. Since



From miniature components to integrated systems

AMF has electronics experience you can use

• AMF experience in electronics covers practically every area of the field, from design through production, of individual components and complete systems, for both government and industry.

• AMF has organized development and production teams experienced in the latest mechanical and electronic techniques. These teams, located throughout AMF, achieve the fine balance so necessary to produce efficient, reliable equipment.

• Particular AMF electronics capabilities and products include . . .

Data Processing and Display • Training Devices and Simulators • Antennas and Mounts
Communication Systems • Low-frequency Radar • Electronic Warfare Devices
Air Navigation and Traffic Control • Missile Check-out Equipment • Electric Motors
Guided Missile Support Equipment • Industrial Relays • Silver-zinc Batteries
Accessory Power Supplies • Inverters and Alternators • Factory Test Equipment

Research, Development, Production in these fields:
- *Armament*
- *Ballistics*
- *Radar Antennae*
- *Guided Missile Support Equipment*
- *Auxiliary Power Supplies*
- *Control Systems*

Another AMF Product
DEFENSE PRODUCTS

Defense Products Group
AMERICAN MACHINE & FOUNDRY COMPANY
1101 North Royal Street, Alexandria, Va.

most of our research and development is contracted to industry and universities there is a continuing need for ARDC personnel to have the "know-how" to secure results through the efforts of others. In order to equip our people to manage and control our programs we have provided extensive training. We are providing at each of our centers management training for our supervisors and for executives courses in advanced management at various universities. A special program in Resources Management at George Washington University and in Engineering Management at Pennsylvania State University add to our own efforts. A special course in Research and Development Management has been developed for senior Air Force officers at the University of Chicago. This program has been supplying the command with up-to-date R&D administrators for the past five years. These programs typify several of the more important opportunities for such training for ARDC personnel.

Plan for the Future

The Air Force will continue to need capable career military and civilian personnel with high professional and technical competence. The available technical manpower of the nation is and will continue to be inadequate for the foreseeable future to meet the needs of government, industry, and educational institutions. This condition will continue to seriously threaten our technological superiority and national security.

Since we cannot get all the technical people we require, steps are being taken to make the most effective development and utilization of the personnel resources now available to us. This need dictates that there be continued development of ARDC personnel management on a broad front. A number of programs is currently under development to meet a future which presents continuing challenges and opportunities for achievement.

Project "Steering Wheel." This project envisions a command-wide program to provide current and long-range information for counseling and assisting officers to chart their careers. It would also provide for planning future assignments realistically in terms of the needs of the Air Force. This program utilizes the proposed Air Force-wide Officer Career Management Structure. Used together these two plans will provide establishment of realistic officer career development.

Direct Commissions. The report on research and development of the Second Hoover Commission concurs with earlier expert studies that there is a proper place and a necessary role for top quality technical officers in the Air Force. This viewpoint justifies the establishment of a continuous input of a few select scientists and research and development engineers into ARDC each year.

In order to meet this critical need for outstanding scientists and engineers in selected positions, ARDC has developed a program of tendering direct commissions in the United States Air Force. Based on the needs of the Command, a group of distinguished university professors will identify for ARDC those few graduates (normally new Ph.D.'s) who are outstanding enough to meet the requirements. When approved, these people will be offered direct commissions in the Air Force Reserve and called to active duty in ARDC. While on active duty these officers will act as catalysts in critical areas of the ARDC mission. Should they eventually leave the service they will remain a valuable source of technical assistance in the Reserve Program.

Specialized Airmen. The Air Research and Development Command recognizes the advantages of utilizing to the fullest extent possible the experience and education of our airmen with college degrees. Although such airmemn are not normally military career-minded, their abilities represent a national resource which should be effectively utilized for national defense during their enlistments.

To this end a series of proposals had been made to Headquarters USAF to establish special procedures for the identification, classification, assignment and utilization of airmen qualified to perform scientific and professional level duties.

Electronic Data Processing. During the past 15 years one of the leading tools developed for the use of scientists and engineers has been the electronic computer. Recently this tool has been adapted for management purposes for the storage, search, and consideration of masses of data. Computers have a multitude of potential uses in the personnel field. Conceivably all the information contained in the basic personnel records can be maintained on computer tapes; instructions which govern routine personnel actions can be programmed; and steps preparatory to substantive personnel decisions can be taken by the machine. With norms introduced into a computer's reporting system, management can be informed only of significant trends and without wading through masses of data, can effectively manage by exception.

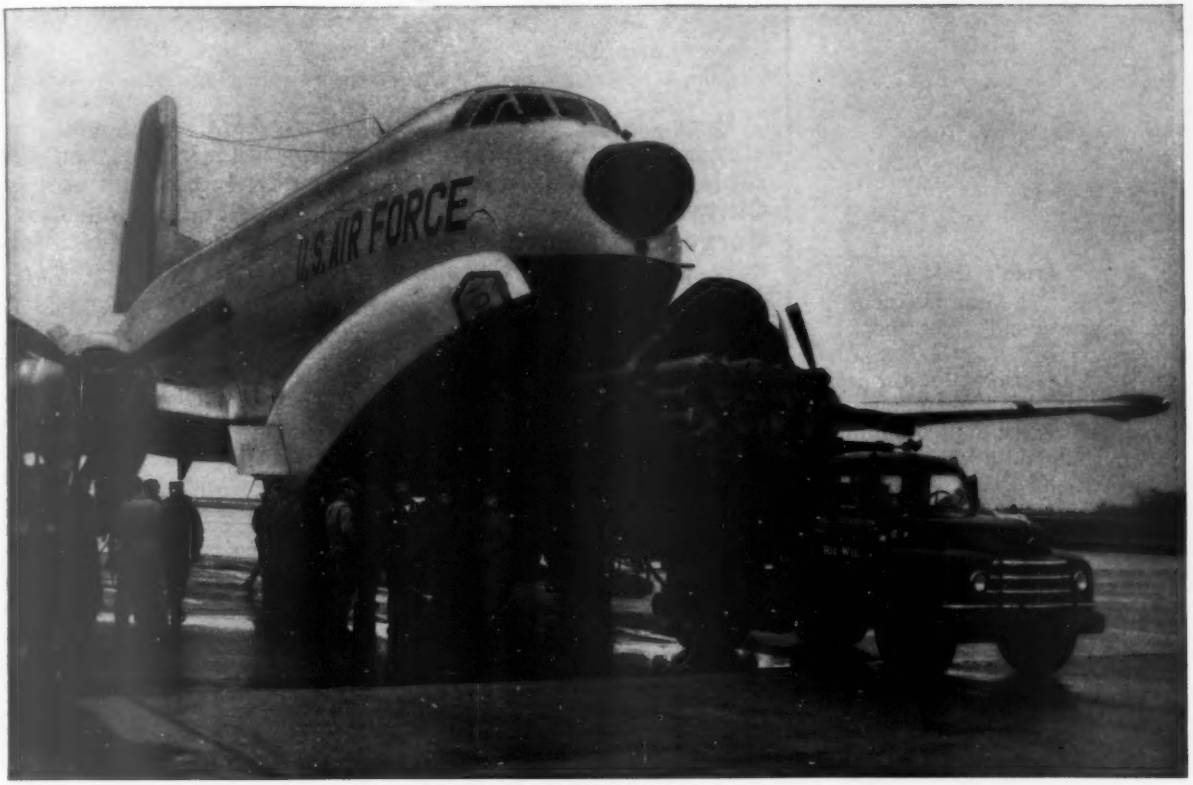
ARDC is currently installing a medium-sized computer for management purposes which has ample potential for maximum use in the ARDC personnel activity. It is anticipated that its uses will speed action, improve the quality of decisions, permit better planning, and save steps and processes.

Job Climate. The effectiveness and productivity of people are directly related to the social environment in which they work. This environment, which may be called "Job Climate," has been improved considerably by numerous individual actions in personnel operations as well as in other management areas.

Studies are under way which will assist ARDC to apply established knowledge, learn more about conditions conducive to human effectiveness, productivity, creativity and job satisfaction.

In summary, we in ARDC feel that we have made significant advances in building a personnel program to meet our special requirements. We are confident that the policies and activities coming along will contribute further to progress in this field of management. Bearing in mind the urgency of our mission and the challenges we face in the personnel area we will continue to press for the development of sound, imaginative and integrated programs.

Delivery...ON TIME...



A delay on this particular job meant valuable time lost . . . dollars wasted . . . Ric-Wil, not only prides itself in offering the finest in prefabricated insulated piping, but takes pride in ON TIME DELIVERY . . . and speaking of delivery . . . the best way to meet piping construction schedules is to contact your Ric-Wil representative early in the planning stage. He will be glad to help on scheduling delivery . . . and "lend a hand" on technical information as well.

New Ric-Wil catalog is available . . . write for your copy . . . now.

Quality Piping Systems . . .
. . . of Exceptionally High Thermal Efficiency

RIC-WIL INCORPORATED

PREFABRICATED INSULATED PIPING SYSTEMS

BARBERTON, OHIO

For more facts request No. 21 on reply card

Research—

Arma's Boss

Top place at Arma Division . . . its line operation is autonomous . . . is occupied by Clifton T. Foss, who, through successive upward steps culminating in general management, has carried the responsibility for research and development continuously for some twenty-five years. Foss (53), although insistent on the 1,100-man engineering team sharing the honor liberally, was largely responsible for the development of the distinctive personality of Arma Division's engineering.

An electrical engineer from Sisseton, S. D., Bachelor of Science and graduate student of the University of Wisconsin. Foss started with Arma as a development engineer and climbed upward via the R&D route. Progressively, he was Asst. Head of R&D, Head of R&D, Asst. Head of Engineering, Head of Engineering, and Vice-President-Engineering. Now, as Vice-President and Division Manager—Arma, he represents for this A.B.A. Division one of the longest R&D management tenures extant.

Weekends, when pressures are off, Cliff Foss is a Connecticut suburbanite with a 3-wooded-acre challenge, a 4-year-old "spit 'n' image" of his wife (respectfully they answer to Linda and Susan), and a bent for cooking thick steaks over charcoal. Any complacency appearing in this typical home-life-of-the-successful-executive gets interrupted . . . and usually in a way that is interestingly different . . . like last summer when, vacationing with his family in Maine, he turned "marine hunter" for 7-800-lb. tuna, a profession in which he admits "not enough skill yet to throw a harpoon, but I did get to handle the boat, which is one of the two key positions on an expedition of this kind."

Here, in an exclusive interview, AFM gives you the views of one of America's leading industrialists on the subject of research and development. In his own words, Clifton T. Foss, vice president, American Bosch Arma Corporation, explains how his company uses the alternate approach to development projects:

AFM—Q. Are the approaches to research changing?

Mr. Foss: In this sense, they are. As conditions have changed and the time pressures have become greater, we have gone to pretty rigidly scheduling both the time and cost of research. This is something that a few years ago we looked at very questionably. Most of us were inclined to say that research would reach a given point at some accidental time just depending upon luck and success and one thing and another. We have departed from that concept rather completely. Today we do schedule research. And, we schedule development. We find that we are able to maintain these schedules with a reasonable degree of success.

AFM—Q. What is the secret?

Mr. Foss: Management, primarily. We start on alternate approaches. Everything that you start out to do can not be expected to come to pass. But by having alternate approaches under way, you can, by admixing schedule demands and the actual requirement, select a means which has progressed further than some of the others and give this one special attention. By this sort of alternate approach and eventual selection geared to a time table, we find that we can schedule developments and get where we are going not only on time, but also within a budget.

AFM—Q. Will you give us an example?

Mr. Foss: Our work in inertial navigation is typical. One of our alternate approaches assumed perfection would not be primarily dependent on higher accuracy of the gyro but on higher accuracy of the accelerometer. Examining all of the then current approaches being taken by ourselves as well as others with respect to the accelerometer, we came to the decision that a very elegant form of approach had not been exploited. It had to do with a vibrating string. We established a research project in this direction . . . abandoned work in other directions except as support in the event that the vibrating string should fail. This has carried us to very pronounced success. I think we have pioneered in this and the point where we are on it today comes from the relatively early recognition of the fact that we were hitting pretty much of a barrier or limitation in the more conventional approaches.

AFM—Q. How did you come to recognize the critical problem was in this area?

Mr. Foss: Strictly through mathematical analysis of the problem and the degree to which various system components would contribute to system performance and system error. Such analysis pointed to the accelerometer as being one of the limiting elements. At just about this same time the use of digital computers for airborne application came very much to the surface and our thoughts then went in the direction of how can we provide an accelerometer which will lend itself most readily to digital type computation. The vibrating string has the virtue of a pulse output,

Alternate Approach Method

which can be fed directly into a digital computer. We made a deliberate effort to develop a device which would get away from the inherent difficulties of the former approaches. The new approach solved the problem.

AFM—Q. Was there invention in in this area?

Mr. Foss: I think there was. More important, however, and overriding the matter of invention is the proper selection of materials, the finesse in design that is used, the using of materials of the right kind in the proper combination and being completely aware at all times of the difficult and severe environment in which the device will later have to operate. It is not a new physical principle.

AFM—Q. Does this mean a minor place in inertial navigation for the gyro?

Mr. Foss: No, it does not. The state of the art and our mastery of the gyroscopic problems had reached a point where it was no longer paramount to an extension of the capabilities of an inertial navigation system. With respect to immediate need for the further improvement of the gyro we were getting into some marginal territory. Right now, we may well have come to the time when the accelerometers have reached such a point of performance that the gyros will again become important and in order to jack the system up to a new level of performance we will have to take the accelerometer as we have it and go to work on the gyro so that it becomes compatible.

AFM—Q. A final question. Recognizing the important place in defense that Arma has won by work in navigation or guidance and in the offensive and defensive system, we would like you to project a quick summary of the organization and philosophy that has brought this about?

Mr. Foss: The questions have kept this interview pretty much within the scope of our engineering organization. Research, development, and engineering are, of course, important elements . . . but, never-the-less, elements among the several that go to make up such a defense facility as Arma Division. Of equal stature and as deserving of credit for our present position are 1) a manufacturing organization highly skilled in precision manufacture and electronics assembly, and 2) a sophisticated and aggressive quality control organization. Embraced in the many seasoned, established, tried groups comprising engineering, manufacture and quality control are almost all of the physical sciences as they are necessary in problems of defense. These groups rate basic importance in terms of the personnel and their long training in this work. But associated with this in terms of overall effectiveness is the organization of all these groups into a team coordinated under one management and one roof, having a full appreciation of the need for a systems concept in engineering and having, also, a full appreciation of the need for rigid control over quality and reliability. This of course goes beyond the research, development and engineering groups and includes very importantly those groups which are going to do the manufacturing, monitor quality, do the inspection, and test and service the ultimate product. Of these supporting groups we are just as proud as we are of the engineering groups. They are on the team. They work right along with the engineering people.

Our philosophy may be said to have three compulsions: 1) make an integrated approach to the whole problem, 2) try to pioneer, 3) undertake alternate approaches. We use a systems concept in tackling a problem. Our engineers define it, analyze it, and lay before us the important elements. They indicate which should receive the individual attention of specialists and which should be subjected to alternate approaches. As development progresses, it is kept under constant observation and at proper times as the schedule calls for, evaluation and analysis takes place. We usually select the one of the alternate approaches that we have been carrying on that has greatest promise and then concentrate our attention on this, again geared to a time table. We recognize that our value to the defense of this nation lies in two areas. First, in being able to pioneer in and carry through with new developments to go beyond what has been done before. Second, in being able to do this work in accordance with specific budgets, both as to money and as to time. If we fall down in either one of these areas, there is something that does not satisfy the whole need. Performance has pretty much demonstrated that we are on the right track.

Missile Gets Final Tests

Washington (AFPS)—The Army's Nike-Herculles, boasting many times the destructive force of the original missile, is undergoing final tests.

Known as Nike B during the development stage, Nike-Hercules is substantially faster and has much greater range than the earlier anti-aircraft weapon, the Nike-Ajax, now guarding key cities and strategic areas, the Army said.

Longer, heavier and more than double the diameter of the Nike-Ajax, the Hercules model will have extreme maneuverability at much higher altitudes and be operational with units in the "relatively near" future, the Army announcement said. Both missiles can be fired with the same system.

Tips on Tools

Norfolk Naval Shipyard, Portsmouth, Va., replaced its high speed steel tools with carbide tipped tools which retain their sharpness much longer. The use of carbide tipped tools has reduced the re-sharpening and machine-down time formerly required when high speed tools were used. Savings realized were approximately $3,000 for one quarter.

Colonel Kowalski (left) and Willard Pluethner, vice-president in charge of communications and brainstorming at Batten, Barton, Durstine and Osborn, Inc., bone up on the ground rules of "Brainstorming."

Can "Brainstorming" Improve Army Management?

By Colonel Frank Kowalski

IN RECENT months, spurred by success of ideation in business and industry, a new and significant interest is developing in the Army in group creative thinking. In this connection, the Navy stole a jump on us in publicizing the "brainstorming" sessions it conducted under the leadership of Charles H. Clark of Ethyl Corporation. Several activities of the Army, however, have had varying success with "brainstorming" for some time. The Engineer Research and Development Laboratories at Fort Belvoir, Virginia, for example, use "brainstorming" to attack their creative problems; The Adjutant General has scheduled instruction in group creative thinking; the Command & General Staff College is interested in the subject and the Command Management School has used the technique to develop organizational ideas.

Can group creative thinking improve management in the Army? The answer is yes. More than that, tank crews and infantry squads can create new and useful ideas. On this premise the curriculum of the Command Management School includes a lecture and demonstration on "brainstorming." These presentations have been received most enthusiastically by the installation commanders and key staff officers attending the course. Many of the participants have indicated that they plan to explore the possibilities of this new technique for generating ideas at their home stations.

How Does "Brainstorming" Work?

There are several accepted variations of the "brainstorming" technique. Each has its peculiar advantages and disadvantages, depending on the experience of the participants and the nature of the problem. The techniques of Osborn; W. A. Pleuthner, Vice President for Brainstorming of Batten, Barton, Durstine and Osborn; Mr. Harold B. Schmidhauser, Director, Executive Commission Course of the American Management Association; and Charles H. Clark of Ethyl Corporation have been found to be highly effective.

How to Start

The ten steps outlined below are based essentially on the technique of the Mr. Schmidhauser and are designed for groups with little or no experience in "brainstorming." The procedure suggested can be modified considerably to suit the leader and the panel. With an experienced panel several of the steps may be omitted.

1.

Orientation of the Group:

The leader assembles his group and explains that "brainstorming" is a cooperative effort by a group to solve a creative problem. He emphasizes the importance of positive thinking; he encourages wild ideas. He shocks his panel members with such absurd demonstrations as driving a nail into a block of soft wood using a china cup as a hammer. He explains that ideas created through "brainstorming" in business and industry have paid off in

dollars and improved methods and procedures.

Here are some typical success stories:

A manager of a chain of restaurants found that washing the scummy ring which forms inside a mustard jar was not only an unpleasant task to his employees but a costly operation. He decided to "brainstorm" the problem using a group of waitresses. In examining the suggestions, he found that most of them were worthless. Two ideas attracted his attention: One girl suggested putting a cover on the jar; another suggested placing the jar upside down. He combined the two suggestions and found he had solved his problem. Putting a cover on the jar and standing the jar upside down permitted the mustard in the objectional rings to go into solution, thus eliminating the need for daily washings.

Here is another:

City fathers, plagued with teenage delinquents, called in a group of ten trouble-makers. Initially, the boys were belligerent and uncooperative. After a sincere explanation of the situation by the adult leader, the boys agreed to "brainstorm" the problem. One of the delinquents volunteered the information that if he wanted to rob an enterprise in town, he would do it at 7:10 a.m. When asked why, he explained that all the police patrols were engaged in raising flags at that exact hour every morning. A lively "brainstorming" session not only produced several practical suggestions for handling delinquents, but actually enlisted the enthusiastic support of the boys to participate actively in the program. Several joined the police patrols to raise the flags at 7:10.

"Brainstorming," like any methodology, has its own rules. These should be explained to the group. Here are five basics:

a. *Set up a specific rather than a general problem*—Any subject is suitable for "brainstorming," but it has to be narrowed down to present a single target for the "brainstormer," to shoot at.

b. *"Think up or shut up"*—Don't criticize or judge ideas. The "brainstormer" cannot stop to study, investigate or evaluate. He cannot judge; he must think up and talk up.

c. *Shoot the Works*—The wilder the idea, the better. It is a simple matter after the session to bring ideas down to earth. Encourage free-wheeling and stimulate a "can-you-top-this-one" attitude. An idea that sounds ridiculous may serve to spark a practical solution.

d. *Strive for Quantity* — The greater number of suggestions, the better are the possibilities for some good ones. Experience has shown that only a few of the suggestions are worthy of consideration. The wild ones often are inspiring.

e. *Combine and Improve*—Ideas grow by additions, subtractions, and combinations. Every new idea should serve as a spring-board from which panel members can leap to still better ideas. Participants should be alert to the possibility of combining two independent suggestions into still another idea.

2.

Organization of the Group:

Orientation completed, the next step is to organize the "brainstormers." At the Command Management School, the group is usually limited to ten or twelve participants. Taken as a cross-section of the class, they include general officers, colonels, senior officers of the Navy, Air Force and Marines

What is "Brainstorming"?

● In its general meaning, the term is used for several methodologies of creative thinking by a group. The original technique of "brainstorming" was developed by Alex F. Osborn in 1939. In his book, "Applied Imagination", Osborn says, "Brainstorm means using the brain to storm a creative problem —and to do so in commando fashion, with each stormer audaciously attaching the same problem." In Osborn's brainstorm sessions", the groups were usually small, 8 to 12 persons. Productive sessions have been conducted, however, with groups up to 150 people.

● In the sense that a "brainstorming" session is a gathering of people to solve a problem, "brainstorming" is a conference. The usual conference, however, is non-creative; action is determined through the deliberate exercise of group judgment. A conferee, accordingly, is respected for his experience, knowledge and the soundness of his views. In "brainstorming", on the other hand, there can be no restraining influence of judgment. The attack on the objective, as in the assault, must be inspired—devoid of all caution. The brain of each participant storms the problem wildly. Only in the integration of the composite group mind is there hope for new ideas and solution of the problem. Many of our senior officers, trained to think logically and judiciously, have considerable difficulty in adjusting to this free-wheeling technique, but when they get the spirit of the "brainstorm", they spout fantastic ideas.

● Any person can have an idea, and so anyone is qualified for "brainstorming". There are no IQ, rank, experience or knowledge prerequisites. W. A. Schmall, an engineer of the General Electric Company, tells this interesting story:

● "We were working on a problem involving design of power transformers. They must withstand a certain density of rainfall without flashing over. We were using a test system that involved an overhead sprinkler and valves to regulate flow of water. Rainfall was gaged by the time needed to fill a measuring cup. We lost a lot of time adjusting valves.

● "A number of us were discussing the problem in the office near the secretary's desk. We wanted to find a method for instantaneously measuring the rate of density of rainfall. We were surprised when the secretary interrupted: 'Why don't you count the raindrops?' " That is exactly what the engineers did, developing an electrolytic process to do the job.

exploring the universe:

GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

GD GENERAL DYNAMICS
DIVISIONS
C-L CANADAIR LIMITED
EB ELECTRIC BOAT
GA GENERAL ATOMIC
ED ELECTRO DYNAMIC
C-V CONVAIR
S-C STROMBERG-CARLSON

First, Earth was all,
then the Sun, and then our Galaxy
of 100,000 million suns,
"like sand . . . flung down by handfuls
and both hands at once".
Now, we know our galaxy
is but one among a billion galaxies
where suns and earths
and atoms are ceaselessly created
by a Universe without
beginning and without end.

worlds without end

Political corollary: If nations may
forsake wars of aggression and deterrence
for a cooperative deployment
of earth's resources to explorations
in space and time, the new science of
astronautics may lead us soon
to the infinite plenty of the planets
and the stars.

and civilian employees of equivalent grades.

The group is seated at a table or in a semi-circle facing the leader who has a blackboard available behind him. A recording instrument is suitably located to record the discussion and the creative ideas. The equipment also includes an alarm clock and a bell.

3.

Stimulating the Group:

Schmidhauser, in preparing the group for creative thinking, likens human minds to stopped-up sinks. There are two ways of clearing a sink—pressure the sink with a rubber plunger or open the sump. Pressure usually results in spewing "slop" all over the operator. Schmidhauser encourages the participants to clear their minds for creative thinking by spouting ideas —opening the sump.

A convenient way to stimulate creativity in a group is to flash large photographs of dogs. babies or oldsters and ask for captions. There are always self-starters and comics who soon generate a lively, cooperative flow of ideas. The leader should be prepared to throw in a wild, different or fantastic suggestion. The group usually pounces on this with improvements and combinations.

4.

Examination of the Problem by the Group:

In working with an experienced group of brainstormers, it is desirable to distribute written statements of the problem to each participant a day or two prior to the scheduled session. This gives the panelists time and opportunity to study the problem and to think up two or three ideas. This also permits an incubation period during which creative thinking ripens to be sparked into illumination at the "brainstorming" session. In the demonstrations at the Command Management School, the problem for "brainstorming" is suggested by a member of the class or preselected by the faculty. It is presented to the group at the session.

The panel chairman writes the problem on the blackboard and requires the group to study and analyze it. He then asks each participant, in turn, to indicate satisfaction with the problem as stated or to stipulate changes he desires. The problem is modified and rewritten. When there is general agreement and satisfaction, the group is ready for "brainstorming."

5.

The Assault:

There is some agreement and considerable difference of opinion among the experts regarding the technique for the assault on the problem. All recommend recording the suggestions either in reportorial form or on a tape or similar recording device. Most use some kind of a psychological "goose" to generate a state of urgency in the participants. There are wide variations, however, in the duration of the sessions. Some of the "brainstorming" enthusiasts prefer rapid-fire assaults of 3 to 5 minutes, while others stretch the sessions into hours.

Based on experience of the Command Management School, the following procedure is suggested: The participants are advised that the assault will be limited to five minutes; the recorder is turned on and an alarm clock is set. The leader with chalk in hand is poised at the blackboard. At the word "GO," the "brainstormers" spout their ideas. The leader writes the gist of each suggestion on the board, while the recorder makes a complete recording. Participants concentrate their attention on the problem, throwing out ideas at machine-gun rate, working against time. Suggestions are pyramided and the excitement is high. If the flow lags momentarily, the leader interjects a wild one and the group takes off like a rocket. If a panel member objects to a suggestion, criticizes or tries to judge, the chairman rings the bell and declares him "out of order." When the alarm rings, the brainstormers relax with satisfaction. There is a feeling that a race has just been run. The ideas on the blackboard are counted; there may be as many as 60 in five minutes.

6.

Recharging the Group:

For the next fifteen or twenty minutes, the group is permitted to relax. The suggested ideas are discussed and the problem is reexamined. The group may find that some of the suggestions indicate that the problem should be further narrowed down. The target area may have been too large and the recorded shots too scattered. A more definitive target is agreed upon and the problem restated on the blackboard in more specific terms.

7.

Second Assault:

The adjusted problem is, again, subjected to "brainstorming" in the same manner as in the first assault. The new suggestions are recorded and counted. The "brainstorming" may be repeated as many times as considered desirable. The session should continue only as long as the panel is having fun. Usually, after the third effort, interest and productivity are low.

8.

Transcribing the Ideas:

The recorded ideas are then transcribed. All references which might identify the individual who suggested an idea are eliminated. The lists are edited by the panel chairman and referred to the person who originated the problem. Copies may be distributed to the participants.

9.

Sifting the Ideas:

It is now the responsibility of the originator of the problem to sift out the wheat from the chaff. The time has come for careful test, judgment and analysis. The complete list should never be shown to the boss. If he is not familiar with "brainstorming," the wild ideas on the list will discourage him. The individual or organization which has the problem to solve is the best qualified to evaluate the suggestions. Normally, only 6 to 10% of the suggestions are worthy of consideration. On the other hand, many ideas which appear impractical to the uninformed have paid off in dollars and better ways of doing things.

10.

Developing the Ideas:

New ideas have little value resting in someone's file; they must be developed into practical applications. It is valuable to follow up

and ask panel members for any afterthoughts. In some problems the panelists themselves are best qualified to put ideas into action. In any case, "brainstorming" is not completed until a tangible result is produced.

Evaluation

To many, "brainstorming" sounds like a crazy operation. When I tried to explain it at an installation staff meeting, the smiles of pity on the faces of the officers present were most discouraging. Those who have not seen its potentialities are skeptical. Those who use it to stimulate group creative thinking like it. Those who have participated as panelists have enjoyed it.

At the Command Management School the student panels have not yet come up with any earth-shaking ideas. The demonstrations, however, have been enthusiastically received. Two problems "brainstormed" by our "brass" panels produced interesting suggestions. In "brainstorming" the question, "How can rate of reenlistment be increased?", one group produced sixty ideas in five minutes. The first editing reduced the number to thirty suggestions worthy of consideration. These ideas were then presented to the class for individual evaluation. The seven suggestions receiving the highest number of votes by the class were referred to volunteers for expansion of the basic thoughts.

In one of the classes a participant requested his colleagues to "brainstorm" the question, "What shall I name the Army's new portable TV set?" At the end of four minutes the class, operating as a whole, compiled sixty names. The five most popular were: Telescout, Scanner, The Eye, Telepeep and Battle Eye.

Some Opportunities for "Brainstorming"

Opportunities for "brainstorming" in the Army are without limit. Whenever someone says, "Where do we go from here?" the occasion is ideal for "brainstorming." The sessions need not be specially scheduled or formal. They can be spontaneous and off-the-cuff. Here are some situations which beg for "brainstorming."

—You want a moniker for a sexless nomenclature like Tank M-60 —or a name for a ball club, a new activity, a maneuver or special operation.—

—You prepared a terrific study. You know it is sound, but you can't figure out how to sell it at GHQ.—

—You have a large number of vehicles deadlined in the shops. The mechanics appear to be indifferent. Ask them to "brainstorm" the problem. The results will surprise you.—

—You are planning your budget execution plan. You want to make sure that all requirements are considered.—

—Your automobile accident rate is high and climbing. You have published the usual command letter. The accidents continue to pile up.—

—You have been informed by Army headquarters that your installation has an exceedingly high rate of off-post delinquencies.—

"Brainstorming" problems like the last two often develop surprising by-products. Here are situations which permit "brainstorming" at the soldier levels. The commander has an opportunity to present the problem through command channels directly to the troops. "Brainstorming" by platoons and even squads will not only produce valuable suggestions from the soldiers but will encourage the troops to participate in the execution of the programs they suggested. Another by-product is that those who "brainstorm" together learn to like each other. How can you resent a person who "built-on" your suggestion in a "brainstorming" session.

Every group or organization contains within it a valuable reservoir of creative imagination; the crucial problem is how to tap this reservoir and then to purify and utilize the results. The suggestion box is one method, but we are all familiar with its limitations. "Brainstorming" is another, and the experience of those who have used it is most encouraging. The investment of time and energy is infinitesimal in comparison to its possibilities. Brains are perhaps our greatest natural resource and "brainstorming" is one way of making this resource pay off.

PRODUCTION Visual Control

not only schedules,

But automatically checks with TIME, LINE and COLOR control

- Original cost and upkeep low.
- Schedules and time checks operations.
- Historical record to back it up.
- Bad situations show automatically.
- Its simplicity has put it into world-wide use.
- Analyze 100 items in 10 seconds.

Effective Tools for Effective Management

WASSELL ORGANIZATION, INC
Westport, Conn.
For more facts request No. 14 on reply card

Ion May Power Planes of Future

Washington (AFPS)—Air Force scientists are probing the possibility of harnessing the energy of the ion, an electrically charged molecule, to power space ships.

The ion is a molecule or atom from which one electron has been stripped. In a vacuum or the partial vacuum of outer space, the ion can be energized by electricity, giving it a propelling force.

Theoretically, "ionic drive" could be produced by ejection of a stream of these electrically charged particles through a pipe to give thrust . . . just as gases energized by heat generate thrust in a jet engine or rocket.

Colonel William O. Davis, deputy commander for operations in the Office of Research, recently told newsmen that "several small" contracts have been let to investigate the feasibility of the idea for propelling ships flying through space in the future at fantastic speeds. He emphasized that the work was experimental rather than developmental.

and civilian employ-
lent grade-

Business and Finance

Is There a "No-Risk" Investment?

Did you ever watch a bewildered husband—unfamiliar with handling the family shopping—hesitate uncertainly before the thousands of colorful cans and packages on the super market shelf? Well, the uninitiated investor is in much the same position today. In reflection of new security "fashions" and changing economic conditions, the investor is now faced with a dazzling display of security "merchandise" of all kinds—including several billion dollars worth of *new* securities in 1956. And in these days of high-powered security merchandising, a potential investor must be able to "read the labels" in the financial super market with some degree of familiarity and confidence.

This security merchandise is of many forms, and you, as an investor, must choose carefully in order to purchase a security with all the characteristics you seek. **What do you gain or lose in buying a corporate bond? . . . or a debenture? What is a preferred stock, and which kind is best? How about common stocks? What do they have that other types don't . . . and vice versa?**

Generally, types of securities are ranked according to the theoretical degree of safety they offer. There may be comparatively little risk in the purchase of certain types of securities. However, the fact that an investment may practically guarantee repayment of your investment plus a fee for use of your money doesn't necessarily mean that it is the best investment for you. There are many other factors that may be of equal or greater importance, such as annual yield, capital growth, and others.

Traditionally, investments having a relatively high degree of safety are considered "senior" securities. **In this, and the articles to follow, we will discuss various security investments according to their "seniority."**

The security investment considered "senior" by many is a bond. Essentially, a bond represents a loan to a corporation, municipality, or other bond issuer. The issuer agrees to pay you a certain sum of money on or before a stipulated date, and to pay you interest on the bond periodically. The assets, or even income, of the issuer are pledged as collateral to insure repayment of the loan. Fundamentally, the quality of any bond depends upon the expected ability of the issuer to redeem the bond when it is due, and to pay the interest as it becomes due. Obviously, then, the bond of a corporation having a sound financial position, excellent credit, a long record of income in both good times and bad, and a reputation of redeeming previous loans when due will have a higher rating than the bond of an issuer with lesser financial standing. Thus, bonds do vary considerably in quality.

Bonds are generally referred to by the type of issuer and the assets pledged to secure the bond. An exception to this is the bonds issued by the Federal Government, which usually are called "U.S. Treasuries," or designated by a letter-type, as "E" bonds, "G," "K," etc.

Municipal bonds are those issued by cities, states, or agencies or commissions established by city charter or state constitution. Some municipal bonds are redeemable only from a specific source or revenue, such as sale of water, sewerage assessments, specific tax levies, etc. Others are general obligations of the issuer, not dependent on one particular source of revenue. In recent years many major bridges, turnpikes, and toll roads have been built through issuance of municipal bonds, with interest payments and retirement of the bonds provided from tolls charged for use of the facilities.

Bonds issued by corporations are usually referred to as "corporate bonds," or "corporates." This general classification is prefaced by the activity of the issuer, such as "industrial," "utility," "railroad," etc. Many hundreds of such bonds are on the market today, differing from each other in interest rates, the nature of the pledged assets, and the priority of claim on those assets by bondholders. A corporation may have several bond issues outstanding, each with different characteristics. One or more of such issues may have priority over the others in the event of default—much like

by W. Mac Stewart

Get the Facts on Investments

With this issue Mac Stewart introduces a series of three or four articles analyzing, in non-technical terms, the various types of securities most commonly purchased by Military personnel. You'll find this series highly informative and valuable to you in your own investment program. Don't miss a single one of these interesting features – be sure your *Armed Forces Management* subscription is up-to-date! And if you're one of our thousands of "borrower-readers," why not have your *own* subscription?

Another
QUARTERLY DIVIDEND
from **HAMILTON FUNDS, INC.**
SERIES H-C7:
4½¢ per share from ordinary income
11¢ per share from securities profits
SERIES H-DA:
4¢ per share from ordinary income
11¢ per share from securities profits
Payable April 30, 1957 to shareholders of record April 2, 1957.
Hamilton
MANAGEMENT CORPORATION

the relationship of a 1st and 2nd mortgage.

Years ago, the quality of a bond was thought by investors to depend upon the nature and value of the property which was collateral for the bond. **A bond was considered primarily a claim on property.** Modern investment thinking, however, recognizes that pledged assets have importance only in the event of default—and if default is in prospect the bondholder has made a sad choice indeed. Today, a primary factor in the quality of a bond is the financial soundness and strength of the issuer. **Thus, a bond is now viewed as a claim on a going business, not on dead assets.**

This new concept has led to the issuance by many corporations of **debentures.** A debenture is similar to a bond in the sense that it is a direct financial obligation of the issuer. It differs from the bond in that there is no collateral to back the loan. It is somewhat similar to a long-term promissory note. The provisions of debentures may vary widely, so it is necessary to investigate the terms and conditions of each to be sure what any particular debenture represents.

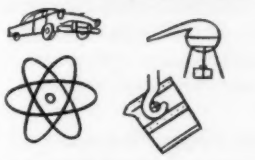
The quality of a debenture issued by a leading corporation is often higher than the bond of an issuer with questionable financial strength. For example, the General Electric 3½% debentures of 1976 have top quality rating—higher than the first lien bonds of many other companies.

The bondholder has a senior claim on the issuer's net earnings —a position of greatest safety. However, no matter how high the quality of the bond, some dollar risk for the individual bond investor is still present, as well as certain other disadvantages. One great disadvantage is that the bondholder does not own any interest in the issuing corporation, hence cannot benefit from the growth of the company which his money is helping to finance, nor does he, in most cases, have opportunity for capital growth as the cost of living rises. The risk involved is the price fluctuation of bonds, which may
on their quality.

Bond prices are usually quoted in percentages, with 100 as a base. A $1,000 bond, quoted at 95½, will cost $955. If quoted at 103¾, it will cost $1,037.50. If you buy a $1,000 bond at 100, you have absolutely no assurance that you will regain your $1,000 when you sell it.

The price of a bond at any given time is determined not only by its quality, but, more important, by the going interest rates for use of money. If current interest rates rise during the time you hold a bond, the price of the bond will decline, and vice versa. For example, consider the Consolidated Gas Electric Light and Power (Baltimore) 1st and refunding 2⅞% Series T bonds, due 1976. This is a top quality bond, secured by a first mortgage and other assets. If you had purchased this bond in March, 1956, it would have cost you about $970. Yet, with all its quality, if you sold the bond nine months later, you would have obtained only about $860—a loss of $110 (or 11%) in a so-called "riskless" investment. During the nine months you held the bond demand for money had driven interest rates upward, causing the price of the bond to drop. At the time you purchased it the bond offered a yield of slightly less than 3%, in keeping with going interest rates at that time. However, when you sold the bond nine months later, the new purchaser would have bought it at a price that would yield him 3⅓%—in keeping

Hamilton Funds
. . . a managed investment fund, holds over 80 common stocks selected for income and growth possibilities. Choice of lump sum or monthly investments. Send for free information.



Hamilton MANAGEMENT CORPORATION
Dept. D, Box 4210, Denver 9, Colo.
Please send prospectus-booklet without obligation.
Name_____
Address_____
City_____ State_____
For more facts request No. 11 on reply card

and civilian employ... lent grade... ...ent interest rates. ... capital risk is present to some degree in almost any senior type of investment. Losses may be created by "tight money," which drives interest rates up and bond prices down. Loss of anticipated revenue may occur if the issuer exercises a right to redeem the bond earlier than scheduled. There is always the risk of deterioration in earning power or value of assets of the issuer. And as with any fixed-dollar investment, inflationary trends lower the purchasing power of your dollars tied up in a bond. **Bonds are not the sure-fire means of capital preservation and income that they were thought to be thirty or forty years ago.**

Next month we will examine preferred stocks as an investment medium, analyzing various types, and delving into the advantages and disadvantages of each.

MATS Aircraft Log '56 Records

Washington (AFPS)—The "Operation Safe Haven" airlift of Hungarian refugees to the United States overshadows all other accomplishments of the Military Air Transport Service in 1956.

But MATS also flew United Nations forces into the staging area at Naples, Italy, for occupation duty in Suez.

These facts were brought out in a recent MATS release.

Overall MATS transport, air rescue, air evacuation, weather and other aircraft logged 1,190,000 hours during the year, an increase of about 20,000 hours over the record-breaking 1955.

Transport operation accounted for half of the year's flying total.

In August, MATS planes passed the 100,000 ocean-crossing mark. This meant the transports averaged an Atlantic or Pacific crossing every 48 minutes since the creation of the command in mid-1948.

Over and Over Again

Waste water from the compressor cooling system which had been going into the sewer line was piped back into the boiler feed water line, at the Naval Air Station, Lincoln, Neb. The diversion saved 440,000 gallons of water a year that had been going "down the drain."

The Facts About ARMED FORCES DAY—MAY 18, 1957

Background: Prior to 1950, Army Day was celebrated on April 6 each year, Air Force Day on September 18, Navy Day on October 27, and the Marine Corps Anniversary on November 10. In April 1949, the Secretary of Defense with the President's approval announced that the four separate events would be consolidated into a single annual observance of ARMED FORCES DAY. Thus, Armed Forces Day was intended to symbolize unification, demonstrate the close working relationship of the Army, Navy, Air Force, Marine Corps, Coast Guard and Reserve Components, and give the public an annual report on the state of the Nation's defense forces.

Date: In selecting a date for this annual observance, the Department of Defense gave lengthy consideration to weather and other important factors. By process of elimination it was finally concluded that the third Saturday in May would involve the least conflict with established public events and the least interference with business, industry, education, and other elements of national community life, and would therefore be most likely to achieve the greatest public participation nation-wide. Accordingly, the President proclaimed the third Saturday in May, 1950, as the first Armed Forces Day.

Slogan: From the first, the Armed Forces Day observance has been devoted to emphasis upon the basic concept that our national security and our free way of life depend upon the power which comes from American teamwork and national unity. The 1952 banner was UNITY—STRENGTH—FREEDOM. The 1953 observance was keyed to the fact that the Armed Forces of the United States represent POWER FOR PEACE—a slogan so appropriate to our national policy that it was retained for the 1954, 1955 and 1956 programs and will be used again for the 1957 Armed Forces Day.

Type of Observance: Although Armed Forces Day is a public event and has been the occasion for a wide variety of community activities, the observance is now essentially an "open house" program designed to promote public interest in and understanding of the Armed Forces of the United States. Wherever feasible, the public is invited to visit posts, camps, stations, bases, armories, reserve centers, and other facilities in our national defense system. The public is, in effect, given an opportunity to make an annual inspection of that system, in which every American has a stake.

Participation: Although major emphasis of Armed Forces Day is on the primary components of the defense team—Army, Navy, Air Force, Marine Corps, Coast Guard, and Reserve Components—invitations to participate are also extended to organizations and programs related to the defense effort.

Public Interest: Records show that the public has welcomed this annual opportunity to see their defense team in operation. In 1955, more than 9,000,000 people witnessed parades and reviews in which approximately half a million uniformed personnel participated.

In 1956, there were approximately 300 more "open house" programs than there were in the preceding year, the increase reflecting greater interest and activity in the Reserve components and auxiliary services, particularly in communities remote from active installations. The first public launching of the MATADOR and the first showing of the REDSTONE were of special interest. In 1956, the Armed Forces Day program had a direct impact upon more than 19,000,000 people in the United States and abroad, in addition to the millions of others who learned more about our national "Power for Peace" through newspapers, magazines, radio and television programs, and other media.

1957 Program: Information as to national, state or local plans for the observance of Armed Forces Day, which will culminate in the May 18 weekend, may be obtained at any Armed Forces active or reserve command or from the Office of Public Information and Special Activities, Department of Defense, Room 2E-788, The Pentagon, Washington 25, D.C.

Engineers Develop Flood Control Idea

A new Mississippi Basin Model has been developed by the Waterways Experiment Station, Corps of Engineers, which can reduce the need for conservative designs, will decrease costs of providing assured safety, and enables experimentation with new ideas in design which cannot be safely or economically done with full scale structures, leading to improved designs that provide greater safety and efficiency at less cost.

By giving advance warning of likely trouble spots in areas endangered by floods, it is of real value in flood-fighting operations. By incorporating the model in flood-fighting operations in April, 1952, the model was one of the deciding factors in preventing damages of $1,300,000 in an area above St. Joseph, Mo.

Background: The Corps of Engineers now has in successful operation a tool for study of Mississippi Basin-wide flood-control problems. A gigantic working model of the entire basin for the Mississippi River has been partially completed at the Waterways Experiment Station sub-office near Jackson, Mississippi. Two hundred acres in area, it portrays to scale the 1,250,000 square mile watershed of the Mississippi River. The project represents more than ten years of detailed study and careful planning on the part of the 20 District and Division offices of the Corps of Engineers vitally concerned with the Mississippi River system, and on the part of the Waterways Experiment Station, the "contractor" for the job.

Before Improvement: Flood routing on streams can be accomplished by analytical methods, but the problem becomes quite complicated when applied to a river system of the size and complexity of the Mississippi Basin. Flood control within this vast area is bringing into being a great interrelated system of engineering works. Existing, authorized, or proposed, these works embrace some 200 odd reservoirs, several thousand miles of levees, and many other structures. Interrelated factors in the design of these works and increasing requirements for coordination of their operation present an engineering problem of great complexity and vital importance. Operation of this vast system of flood-control works for relatively local protection could, under certain conditions and without proper coordination, reduce flood control effectiveness or even create greater flood problems downstream.

After Improvement: The Mississippi Basin Model offers a means of integrating rapidly and automatically the results of any probable sequences and combinations of flow from the Mississippi River and all of its tributaries. The important effects of timing, storage, and discharge throughout the basin would be prohibitive if such investigations were confined solely to mathematical procedures. However, because of the ease with which variables can be introduced in the model, once the basic setup has been made, a large number of conditions can be tested in a relatively short time. Effects at all points throughout the whole length of the river valleys can be easily seen and directly measured in the model, whereas effects can be obtained only at key points in computational procedures. With the model all phases of a problem can be carefully explored to produce a more extensive and authentic solution or answer.

Management Techniques Used: Applied Research.

'Eye' That 'Hears' Detects Static for Plane Manufacturer

An "eye" that "hears" quick as a wink is now being used to detect and eliminate interference in the radar, communication and navigation systems of newly-built jet fighter-bombers.

R. S. Bergen, chief of the quality control electronics laboratory at Republic Aviation Corporation, where the new device was developed, said it reduces to half a day the three or more days it has taken to check aircraft electronic equipment on the production line. This check is to make certain that a pilot will be able to hear his radio clearly or that there is no electrical interference with the operation of his radar equipment.

Navy Exercises Started in Carib

Norfolk, Va. (AFPS)—A series of Atlantic Fleet amphibious training exercises is underway in the Caribbean. They are scheduled to continue until early May.

About 15,500 Navy and Marine Corps personnel, 16 ships and 150 Marine aircraft are scheduled to participate.

First is a Marine air-ground task force troop training exercise at Vieques, P.R.

Second will be air and naval gunfire training in support of amphibious operations at Culebra, P. R.

In late April Atlantic Fleet forces will participate in "Caribex." It is to be a joint amphibious and airborne training exercise in the Canal Zone.

Jet Flight-Trainer With Special Brain Under Construction

Waltham, Mass. (AFPS)—A jet flight-trainer with a new electronic brain is being developed at Sylvania Electric Products, Inc., here.

The new trainer, which is to simulate a wide variety of aircraft including the most recent supersonic fighters, will provide needed additional speed and versatility in ground training devices, a Sylvania official said.

The device is built around a new large-scale digital computer of great flexibility, speed and accuracy, the official explained. Although the cockpit itself does not move, he said, the electronic brain simulates flight by setting appropriate readings on the instruments.

Eventually the computer will be able to solve problems for several cockpits simultaneously—for independent flight, flight formations or simulated combat, he said.

The program is sponsored by the Navy and the Air Force.

Signs of Times and Places

Recommended to replace metal and wood outdoor station signs is tempered masonite by the Naval Air Station, New Orleans, La. Under the weather conditions in the Gulf area, the tempered masonite is reported to have proved effective and durable.

ON CAPITOL HILL

Latest Facts on the Cordiner Situation

The situation respecting the recommendations of the Cordiner Committee appears to have grown more confused than ever within the past month.

As indicated in the March Issue of *Armed Forces Management*, the Secretary of Defense expressed the hope on January 20 that the recommendations of the Cordiner Committee would be "ready for processing through the Executive Branch within a matter of days." Progress has been made but the complete Cordiner report still has not cleared the Executive Department for submission to the Congress.

Civilian Pay

In addition to the military pay proposals, major recommendations of the Cordiner Committee relate to the compensation of technical and professional civilian personnel. There are approximately a million civilians in Civil Service classified grades employed by the United States Government. A subcommittee of the Cordiner Committee, under the chairmanship of Mr. Charles R. Hook, devoted its efforts to this phase of the overall defense personnel problem. The subcommittee's recommendations, adopted by the full committee, envisage substantial pay increases for classified civilian employees in Civil Service grades GS-7 and above. The raises amount to an average of about 15% and range from approximately $500 to $3000 per year. It is significant to note that these recommended raises are not restricted to engineers, scientists or other especially skilled employees but are recommended for all classified employees in grade GS-7 and above. About 350,000 persons would be affected.

It seems obvious that pay increases for all classified employees in grade GS-7 and above within the Defense Department cannot be supported without extending such benefits to all similar employees of other Executive Branches of the Government. The Civil Service Commission would never support such a distinction.

It also is somewhat difficult to understand the committee's action in eliminating classified civil service employees in grades GS-6 and below from any wage increases. This distinction will be difficult to establish "On the Hill." In fact protests are already being made to influential members from the lower classified grades who want to be assured of at least what they consider a proportionate share of any pay increases granted by the Congress. These protests already have been recognized by Senator Olin D. Johnston (S.C.) Chairman of the Senate Committee on Post Office and Civil Service, who has publicly gone on record in favor of a pay raise for all civil service personnel. He has sponsored a bill of his own which includes all classified civil service personnel, postal and professional and scientific employees. He has announced that he will hold hearings on this bill during the present session of Congress.

The 550,000 Government postal workers already have started a drive for increased pay. During the Lincoln Day recess of Congress, postal workers throughout the country took advantage of the presence of members of Congress in their local communities to press for increased salaries. The Letter Carriers Union has demonstrated in the past that it is a force to be reckoned with at the Capitol. It may be expected to leave no stone unturned which may help its members to get their share of any Government pay increase voted by Congress.

This same discontent with the Cordiner recommendations as reported in the press is beginning to make itself felt in mail being received by members of Congress from both military and civilian personnel. A large volume of mail is being received by members of Congress on this subject. Initially much of the mail supported the Cordiner proposals and urged prompt congressional action, but within the past few weeks the tenor of the mail has changed and it now appears that the majority is coming from individuals and groups of individuals who feel that they are left out or that others are receiving greater benefits.

It cannot be argued but that Government service is not as lucrative as industrial employment during times of national prosperity. In this respect the Cordiner findings support the contention of all Government workers for raises to place them on a par as to salary with industrial employees. However, the efforts of these various groups to adopt the Cordiner findings to the solution of their own pay problems tremendously complicates the task of preserving the purposes for which the Cordiner Committee was appointed. It is unfortunate that these worthwhile purposes are being used by special interest groups to further their own ends.

Some action must be taken, and taken promptly, to stop the loss of professional and technically trained people, both military and civilian, from the Defense establishment.

The findings of the Cordiner Committee in this respect are sound and the committee's preliminary recommendations appear designed to correct this situation. However, this objective may well be lost in the scramble for increased pay. Should this occur, it is possible that no one will get a raise and our National Defense Establishment will continue to deteriorate through its inability to hold the professional and technically trained people necessary to accomplish the tasks of the atomic age. Much work must be done at the Capitol by both the Cordiner Committee and the Defense Department to present the Cordiner plan for what it is—a modernized philosophy of compensation, not just another pay bill—before any hope will exist for its enactment during this session of Congress.

Recent Congressional Action

Hearings and debate on the President's Near East Resolution occupied the full time of the Senate during January and February. The

Senate Armed Services Committee sat jointly with the Senate Foreign Relations Committee on this subject and took no action on legislative matters within its own jurisdiction. No formal organization meeting was held prior to March 1.

The House Armed Services Committee, to the contrary, proceeded with the consideration of numerous minor bills of interest to the personnel of the Armed Services. Among these two bills were reported, and subsequently passed by the House of Representatives, which are worthy of specific mention. These are: a bill dealing with the occupancy of substandard housing and a bill to increase the career opportunities of nurses in the military service. The Substandard Housing Bill passed both the Senate and House last year but failed to become law due to differences in language which were not resolved prior to adjournment of the last Congress. There is every reason to believe that a bill satisfactory to both Houses of Congress will pass this year. It will benefit service personnel by permitting those assigned housing, considered substandard in accordance with Defense Department criterion, to draw their rental allowances and to pay rent at a figure determined locally to be fair for the accommodations furnished instead of losing their entire rental allowance.

Reasons Not Clear

For reasons not quite clear to ARMED FORCES MANAGEMENT, nurses in the military services generally have been left behind in legislation providing career opportunities for commissioned personnel enacted since the end of World War II. The President became personally interested in their situation after his heart attack in 1955, and directed the Defense Department to initiate appropriate legislative action for their benefit.

It is too early to determine at this time exactly what form such legislation will take when it finally reaches the President's desk, but in view of the passage of a nurse's bill by the House of Representatives this early in the session, it is reasonable to presume that the Senate will act on the House bill prior to adjournment.

U.S. Arms Interceptors With Atomic Warheads

Washington (AFPS) — Nuclear weapons, necessary to protect the nation against air attack, now arm interceptor planes in the U.S., Secretary of Defense Charles E. Wilson has disclosed.

In announcing the strengthening of our air defenses, Mr. Wilson also said atomic warheads will be used on surface-to-air guided missiles such as the Nike-Hercules, an improved version of the present Nike, and the Talos, protecting strategic military bases and cities.

The first of these nuclear weapons, now available to the Air Defense Command, is an air-to-air rocket launched from interceptor-type aircraft.

The new rockets, which have not been identified officially, can destroy planes at considerable distance from point of burst, and because of their great power, will increase the effectiveness of interceptor squadrons and ground based air defense units in stopping enemy bombers short of American targets, Mr. Wilson declared.

"Elaborate precautions have been taken in the design and handling of these air defense weapons to minimize harmful effects resulting from accidents either on the ground or in the air," Mr. Wilson assured the public.

He also said tests conducted by the Atomic Energy Commission have proven the possibility of nuclear explosions from accident or fire virtually non-existent.

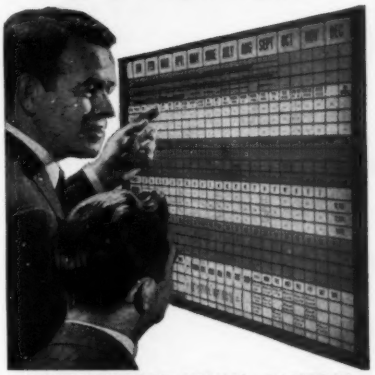
Schedules under which atomic weapons will be deployed at individual bases or installations will not be released for reasons of military security, Mr. Wilson said, nor will such installations be identified.

Test Jet Escape Seat

Washington (AFPS)—A winged "flying seat" for ejecting pilots safely from planes traveling more than 1,500 mph has been developed for the Air Force.

A full-scale model of the system is being tested by the Air-Research and Development Command at Hurricane Mesa, Utah. It was designed and built by the Lockheed Aircraft Corp.

How To Get Things Done Better And Faster



BOARDMASTER VISUAL CONTROL

- ☆ Gives Graphic Picture—Saves Time, Saves Money, Prevents Errors
- ☆ Simple to operate—Type or Write on Cards, Snap in Grooves
- ☆ Ideal for Production, Traffic, Inventory, Scheduling, Sales, Etc.
- ☆ Made of Metal Compact and Attractive. Over 100,000 in Use

Full price $49.50 with cards

FREE 24-PAGE BOOKLET NO. AM-50 Without Obligation

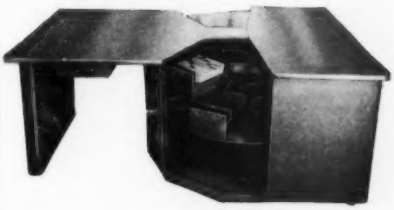
Write for Your Copy Today

GRAPHIC SYSTEMS

55 West 42nd Street • New York 36, N. Y.

For more facts request No. 15 on reply card

"I love my New Order Desk. I find or file an Order or a Master in Seconds! My Boss is in better humor, too. Before I was on my feet as much as at my desk"



WASSELL CORRES-FILE ORDER DESKS

give finger tip control of all records. Cards and correspondence or orders can be mixed. All records instantly available.

Free **DESCRIPTIVE CATALOG**

Effective Tools for Effective Management

WASSELL ORGANIZATION, INC.
Westport, Conn.

IN USE IN ALL BRANCHES OF GOVERNMENT WRITE FOR NEW BOOKLET "ORDER DESK"

Consult our GSA Federal Supply Service Contract Class 54—Part III—Sec. B—Cont. No. GS-OOS-3072 GSA Distribution Code 78 & 79 Item No.'s 54—1—675 and 2325

For more facts request No. 24 on reply card

Management Briefs from the Services

USAF General Smith to Armed Forces Japan. The American Far East and Pacific Commands to be merged on 1 July will be commanded by Lieutenant General General Frederic H. Smith, Jr., USAF, now commanding general of the 5th Air Force. As a part of the reorganization the Far East Air Force Command will be shifted to Hawaii, and the United Nations Command headed by General L. L. Lemnitzer will move to Korea.

Engineering Seminar. The annual Cornell University Industrial Engineering Seminar will be held June 11-14th at Ithaca, New York. The seminars provide an opportunity for critical study and reappraisal of some of the major problems of manufacturing, planning and control. For additional information you are invited to contact Dr. Andrew Schultz, Jr., Department of Industrial and Engineering Administration, Cornell University, Ithaca, New York.

Taconic (AGC 17) Has New Skipper. Captain William V. Pratt, USN, has assumed command of the TACONIC assigned to the Amphibious Force, U.S. Atlantic Fleet, Norfolk, Virginia. Captain Pratt reported to his new post from the staff of the Commander-in-Chief Atlantic Fleet, where he served as Chief of Staff for Administration. A 1933 graduate of the Naval Academy, the Captain has held numerous posts in a variety of ships during his Naval service.

Two Dollars Saves $200,000. Two Patrick AFB, Florida airmen have developed a two dollar gadget that is reported to be doing the work of a $200,000 ground control approach training unit. Base commander Colonel David J. Munson, USAF, reports that the trainer works well and has praised the efforts of A2/C M. D. Hudson and A/1C T. C. Wirth the inventors. The trainer consists of a rectangular frame with wires enabling the operator to estimate information needed to bring a plane in on a simulated blind landing.

New Army School Buildings Dedicated. Attended by key members of the military and civilian communities, dedication ceremonies, were recently held at the Army Language School, Presidio of Monterey, California, for a new $600,000 classroom and $1,200,000 student dormitory. Sealed in the cornerstone were four documents translated into 29 languages taught at the school containing statements of dedication, an information catalog on the school, a copy of the dedication program, a copy of a local daily newspaper, and a pair of spurs.

Management Meter at Andersen AFB. In order to put management information at the commander's fingertips daily, the management analysis division has constructed a management meter. A quick glance at the meter shows which areas need attention and which are satisfactory. More complete details may be had by writing to Colonel Frank E. Marek, base commander at APO 334, San Francisco.

SF Naval Shipyards Upps Local Maximum Award to $500. Shipyard employees may now earn local awards up to $500 for contributions under the Navy's Incentive Awards Program. Awards up to $25,000 may still be made with Washington approval, however, the new raise is expected to add impetus to the now high participation rate.

New Coast Guard Assignments. Rear Admiral William W. Kenner is leaving the headquarters personnel office after a three year tour, to command the 7th Coast Guard District at Miami, Florida. Rear Admiral Raymond J. Mauerman, Superintendent of the Academy at New London is retiring 1 July and will be relieved by Rear Admiral Frank A. Leamy, now commander of the 9th Coast Guard District.

Sixth Army Graduates Instrument Pilots. The Army gained 18 new instrument pilots recently by graduation from the first new Instrument Flying Course by the Sixth United States Army. Colonel Frank G. Forrest, Chief of the Aviation Section, has started the second class and present plans are to continue with new classes at eight-week intervals.

New Chopper Flight Records. A new syllabus flight time record was achieved recently at HTU-1, ALF Ellyson Field, Pensacola, Florida, when 243.2 student hours were flown in a single day. A second record fell on 15 February when a new weekly average of 1049.1 syllabus hours were completed in a week. The third record to be broken was the completion for 25 students of helicopter training during one week.

Three Win Dollars in Pittsburgh District Engineer Office. Colonel H. E. Sprague, District Engineer, recently presented three civilian employees with certificates and award checks in recognition of their adopted improvement suggestions. Mr. R. S. Shelby received $70 and Mr. Gaylord Watson, $25, for their suggestion that quoin blocks be changed from cast steel to a welded design of structural steel which could be fabricated as needed. Miss Augusta Wronowski received a check for $20 for her idea to rubber stamp the date on all teletype messages, as an aid in later locating messages of a specific data.

General Rawlings Receives Kiwanis Award. "Four-Star Neighbor" is the honorary title recently bestowed on General E. W. Rawlings, Commander of the Air Materiel Command, by the Kiwanis Club of Dayton, Ohio. In impressive ceremonies attended by leading local Kiwanians and citizens, John Yeck, club president, presented the General with a framed parchment which praised him for his "friendly, helpful, cooperative and sincere" approach to the relationship between AMC and the citizens of the Dayton area.

MHE Operations Course. The Naval Aviation Supply Depot recently hosted an 8-week training course stressing the safe and efficient operation of industrial trucks. Sponsored by the Philadelphia Chamber of Commerce Safety Council in cooperation with the American Society of Safety Engineers and the Naval Depot, it is believed the course accomplished not only more safety consciousness but will increase production. Representatives included operators and supervisors from twelve industrial organizations in the Philadelphia area.

500th Graduate of AG Manpower Control Course. The 500th graduate recently received his diploma from the Manpower Control Officer Course at the Adjutant General's School, Fort Benjamin Harrison, Indiana. The course was established in 1952 by the Department of the Army to train senior Army military and civilian personnel in the effective and economical use of manpower. Major George R. Goodrich, CE, Marion Engineer Depot, Marion, Ohio, was the 500th man to complete the five-week course.

Auxiliary News in Third CG District. Rear Admiral H. C. Perkins, Commander, Third Coast Guard District, and Captain H. B. Roberts, Chief Director of Auxiliary, Washington, D.C., were honored guests recently at the Tenth Annual Northern Area Conference of the Third District's Coast Guard Auxiliary. Lieutenant Commander Edward P. Sawyer, USCG, Director of Auxiliary Third Coast Guard District, announced that Mr. Bliss Woodward has been elected to the post of Commodore.

AF Medics Visit Lockheed. Nineteen officers from the Air Force School of Aviation Medicine at Randolph Field, Texas, visited the Van Nuys, California plant of the Lockheed Missile Systems division on March 12th for a day-long briefing on "Human Factors in Missile Systems." A second briefing was held on 15 March at the Burbank plant on aeromedical aspects of various aircraft projects.

New Navy Supply Course. The Bureau of Supplies and Accounts have completed a series of 20 seminars designed to keep officers abreast of developments in supply management at the Navy's Postgraduate School, Monterey, California, and the material has been included in a new five-month Supply Management Course. The program for the first new group which is presently about the halfway mark, includes many new techniques in supply and management.

COMZ Europe Suggestions. During the calendar year 1956 the Incentive Awards and Work Simplification Program in United States Communication Zone Europe generated savings and/or benefits totaling $759,049. A total of 2,460 employee suggestions were received for which civilian employees earned $7,198 in cash awards.

Management Reduces Costs. Operating costs at the Signal Corps Training Center, Fort Gordon, Georgia, have been reduced by more than $130,000 since the inception of the Engineered Performance Standards Program last spring. The reductions, which ultimately will result in a greater stretch of the tax dollar, were brought about through recommendations made as a result of management studies. The EPS program is aimed at (1) reducing operating costs by increasing maximum efficiency and (2) the most economical utilization of manpower, machines, materials and physical plant.

Seattle Army Terminal Employees Pocket $970. The Seattle Army Terminal employees recently shared $970 for four superior job citations and seven adopted suggestions. T.V.S. Mustard, a Freight Traffic Division statistical clerk-typist, was awarded $80 for suggesting that unit cube measurement figures be shown to the nearest tenth of a cubic foot. Formerly, unit cubes were shown either to the nearest twelfth, tenth or cubic inch, which made balancing and computation of records difficult. The suggestion proved to be of sufficient merit it has been adopted Army-wide.

West Point Prep School Moves. The Department of the Army recently announced that the West Point Preparatory School will move sometime in July from Stewart Air Force Base, New York to Fort Belvoir, Virginia. The 20-week course, intended to prepare students for entrance requirements, is open to all qualified members of the Armed Forces on active duty that have been nominated or who will compete for appointments to the Academy.

Dean New CO Second Marine Regt. Colonel Raymond L. Dean, USMC, recently relieved Colonel Robert E. Cushman, Jr., as commanding officer of the Second Marines, 2nd Division at Camp Lejeune, North Carolina. Colonel Dean was formerly Division Communications-Electronics Officer. A native of North Carolina, the colonel entered the Marine Corps in 1936.

Last Class of Japanese Pilots. The last and largest group of Japa-

WASHINGTON D.C.

SPECIAL Military Rates from $5 single $8 double

Raleigh

on Famous Pennsylvania Ave.

Midway between the Capitol and the White House

Headquarters for tourists and business people . Raleigh Room renowned for fine cuisine . . . Pall Mall Room for Banquets

Special Courtesies to Honeymooners.

JOSEPH MASSAGLIA, JR., President

JACK WILDER, General Manager

Other MASSAGLIA Hotels

- HOTEL MIRAMAR Santa Monica, Calif.
- HOTEL SAINTE CLAIRE San Jose, Calif.
- HOTEL WILTON Long Beach, Calif.
- HOTEL EL RANCHO Gallup, N. M.
- HOTEL FRANCISCAN Albuquerque, N. M.
- HOTEL RALEIGH Washington, D. C.
- HOTEL BOND Hartford, Conn.
- HOTEL SINTON Cincinnati, O.
- HOTEL SHERWIN Pittsburgh, Pa.
- HOTEL PARK LANE Denver, Col.
- WAIKIKI BILTMORE HOTEL Honolulu, Hawaii
- HOTEL NEW YORKER New York City

World-famed hotels—Teletype service—Family Plan

nese fighter pilots to receive training in the United States graduated recently from advanced Fighter Training at Williams Air Force Base, Arizona. The group consisting of two colonels, seven captains and two lieutenantss returned to Japan where they will be assigned to the Japanese Air Force's newly organized 1st Fighter Wing.

Navy in Norfolk Save Dollars. $35,826 saved in a single year is the pay-off for a suggestion submitted recently by Keith G. Bennett, civilian employee at the Norfolk Naval Shipyard in Portsmouth, Virginia. Rear Admiral George A. Holderness, USN, Shipyard Commander, presented Bennett with a check for $405 recently which represented the largest single award in the yard's history. The idea was for the elimination of hinges on life-line stanchions.

Tire Sling Invented by Airman. M/Sgt Culmer E. Darby, assistant aircraft maintenance dock chief of the 1741st Air Transport Squadron, Palm Beach Air Force Base, Florida, recently invented a canvas tire sling which simplifies aircraft tire changes and saves both personnel and dollars. Without the sling, a tire change for a heavy transport usually required three or four men and took considerable time. Darby with some surplus canvas and tubing whipped-up his invention which cuts the dollars and manpower in half.

New Deputy Director for AFIP. Colonel Joe Morris Blumberg, MC, was recently appointed Army Deputy Director of the Armed Forces Institute of Pathology. The AFIP is the central laboratory of pathology for the United States Army, Navy, Air Force, Veterans Administration, U.S. Public Health Service, Atomic Energy Commission and other Federal agencies.

WAC Advanced Course. Fifteen majors and seven captains recently began the fourth class of the WAC Officers Advanced Course at the Army Training Center, Ft. McClellan, Alabama. The 23 week course is designed to prepare career officers for high level staff assignments.

Army's First Comptrollers' Conference

In December, 1956, the Army held a world-wide Comptroller Conference. This was the first time since 1951 that all the Comptrollers of the major commands of the Army had been together to discuss their common problems.

The conference was presided over by Mr. L. W. Hoelscher, Deputy Comptroller of the Army.

The Honorable Chester R. Davis, then Assistant Secretary of the Army for Financial Management, reviewed briefly the progress which the Army has made in the management of its financial affairs and its business administration. The Secretary reviewed the major areas which are a responsibility of his office and spoke hopefully that the Army would be the first executive department of Government to have in operation a cost-based budget patterned after the recommendations of the Hoover Commission, and established as a requirement for the Government as a whole by the passage of the so-called "Kennedy Bill" by the last Congress. Secretary Davis said:

"We are justifiably proud that we shall be among the first, if not the first, to have met the requirements, and we think that this accomplishment will be recognized and will yield considerable benefits to the Army and to the American people."

A major aspect of the conference was a discussion of the Army Command Management System, which is essentially a system for integrating the programming, budgeting, accounting, manpower control and performance analysis processes of the Army.

In addition to those attending the conference from within the Continental United States, several officers came from far away assignments.

In his closing remarks to the conference, Lieutenant General Laurin L. Williams emphasized the gains to be made by decentralization of authority down to the lowest operating level. General Williams particularly emphasized the necessity of reducing the reporting work-load of the Army, and said in conclusion: "It is a problem that strikes at the very heart of Army management."

"Buy of The Month" Winner Leslie E. Berg recently won the Air Materiel Command's "Buy of the Month" award by designing a procurement plan which made it possible to formally advertise a previously sole-source procurement. In doing so he established a new source for vitally needed equipment and further produced a considerable reduction in costs to the Air Force.

High Award Honors Designer of XF-104

New York (AFPS)—The designer of a supersonic jet fighter plane has won the Sylvanus A. Reed Award of the Institute of the Aeronautical Sciences.

Clarence L. Johnson, vice president of engineering and research of Lockheed Aircraft Corp., designed the XF-104.

He also supervised the construction and designed the XF-90, a twin-engine jet fighter that was never put into production.

The award, in memory of Dr. Sylvanus A. Reed, designer of metal aircraft propellers, was "for design and rapid development of high performance subsonic and supersonic aircraft."

Professional Services

Plan *Your* Future Now . . . Here are the Opportunities . . . and their Locations

In this professional vacancy list published each month ARMED FORCES MANAGEMENT invites the listing of any position, *GS-9* or above. This cut-off point was established on the basis that GS-9 and above positions entail as a major portion of the duties management responsibilities. Space limitations in this Department will preclude so-called "wholesale listings". Apply direct to the installation where the vacancy exists. For information about other jobs, write or visit the nearest military installation.

Title and Location	Grade	Remarks
U.S. Naval Engineering Experiment Station Annapolis, Maryland		
Technical Director	GS-16	
9th Coast Guard District Main Post Office Bldg., Cleveland 13, Ohio		
Architect	GS-11	
Marine Engineer	GS-11	
Civil Engineer	GS-9	3 vac.
Mechanical Engineer	GS-9	
14th Coast Guard District, Honolulu, T.H.		
Civil Engineer	GS-9	
11th Coast Guard District Long Beach, California		
Mechanical Engineer	GS-9	
U.S. Marine Corps, Marine Corps Supply Center Barstown, California		
Supervisory Electronics Engineer (Radio)	GS-12	
Electrical Engineer	GS-11	
Supervisory Procurement Officer	GS-11	
Civil Engineer	GS-11	
Supervisory Prod. Control Specialist (Gen.)	GS-11	
Supervisory Organization & Methods Examiner	GS-11	
Supervisory Landscape Architect	GS-9	
Cheli AFS, Cal.		
Supvy Production Standards Specialist	GS-11	
Industrial Engineer	GS-11	
Mission Evaluation Inspector	GS-9	
Analytical Statistician	GS-9	
Supvy Civil Engineer (gen)	GS-9	
James Connally AFB, Tex.		
Supvy Civil Engineer (Planning)	GS-12	
Civil Engineer (Planning)	GS-11	
Supvy Publications Editor	GS-9	
Budget Officer	GS-9	
Keesler AFB, Miss.		
Supv Elec Engineer	GS-12	
Supv Mech Engr (Heating)	GS-12	
Chemical Engineer	GS-11	
Elec Engineer	GS-11	
Mech Engr (A/C & Refrig)	GS-11	
Mech Engr (Heating)	GS-11	
Structural Engineer	GS-11	
Elec Engineer	GS-10	
Cost Accountant	GS-9	
Organization & Methods Examiner	GS-9	
Kirtland AFB, N. M.		
Electronic Engineer (Gen) (Instrumentation-Radio)	GS-12	2 vac.
Electronic Engineer	GS-12	
Electrical Engineer	GS-12	
Mech Engineer	GS-12	
Flight Test Engineer	GS-12	
Physicist	GS-12	
Rsch Psychologist (Exper)	GS-12	
Aero Develop Engineer	GS-12	
Research Psychologist (Exper)	GS-11	
Mathematician	GS-11	
Electrical Engineer	GS-11	
Civil Engineer (Planning)	GS-11	
Electronic Engineer (Gen)	GS-11	
Electronic Engineer (Instrument)	GS-11	
Communications Specialist (Gen)	GS-11	
Flight Test Engineer	GS-9	
Research Psychologist (Exper)	GS-9	
Langley AFB, Va.		
Operation Analyst	GS-14	
Historian (National Defense-Supervisor)	GS-12	
Mechanical Engineer (Heating & Ventilation)	GS-12	
Sanitary Engineer	GS-12	
Civil Engineer (Planning)	GS-11	
Management Analyst	GS-11	
Methods Examiner (Forms)	GS-9	
Training Instructor (Instrument Trainer)	GS-9	
Cost Accountant	GS-9	
Mechanical Engineer	GS-9	
Electrical Engineer	GS-9	
Accountant	GS-9	
Stock Fund Accountant	GS-9	
Civil Engineer	GS-9	
Army Electronic Proving Ground, Fort Huachuca, Arizona		
Supervisory Electronic Scientist	GS-13 and GS-14	2 vac.
Military Intelligence Analyst	GS-12	
Analytical Statistician	GS-12	
Analytical Statistician (Engineering)	GS-9	
Supervisory Physicist (Radio)	GS-14	
Psychologist	GS-9, GS-12, GS-13	3 vac.
Supervisory Meteorologist (Research & Devel.)	GS-12	
Meteorologist (Research & Devel.)	GS-11	
Mathematician	GS-11	
Publications Editor (Phys. Science & Eng.)	GS-9	
Illustrator	GS-9	
Board of U.S. Civil Service Examiners Departments of Army and Navy 445 Federal Building Louisville 1, Kentucky		
Deputy Controller (Accountant)	GS-13	
Welding Engineer	GS-9	
Launcher Design Engineer	GS-9	
Accountant (Industrial Cost)	GS-9	
Accountant (General)	GS-9	
Kirtland A.F.B., New Mexico		
Research Psychologist (Exper.)	GS-9	
A/C Installation Electrician	WB-16	
Experimental Instrument Mechanic	WB-17	
A/C Sheetmetal Worker	WB-17	
Lake Charles A.F.B., La.		
A/C Propeller Overhaul Foreman	WF-6	
Simulated Flight Trainer Repairer	WB-19	
Langley A.F.B., Va.		
Operations Analyst	GS-14	
Air Intelligence Specialist	GS-13 and GS-14	2 vac.
Structural Engineer (Bldgs.)	GS-12	
Management Analyst	GS-11	
Navy Overseas Employment Office (Pacific) 45 Hyde Street, San Francisco 2, Cal.		
Positions Available on Guam, Mariana Islands. For "GS" Positions Add 25% to Salary.		
Architect (General)	GS-9, GS-11 & GS-12	
Automotive Transportation Specialist	GS-9	
Cartographer	GS-9	
Tabulating Equipment Operations Supervisor	GS-9	
Position Available in Japan—Substantial Housing Allowance		
Analytical Statistician, Supervisory	GS-11	
Positions Available in Hawaii—Add 20% to "GS" Salaries		
Position Classifier	GS-9	
Statistician	GS-9	
Mechanical Engineer	GS-11	
Industrial Engineer	GS-11	
Electrical Engineer	GS-11	
Bureau of Yards and Docks, Navy Department Washington, D.C.		
Realty Officer	GS-11, GS-12, GS-13, GS-14	6 vac.
Personnel Officer	GS-11	
Methods Examiner	GS-12	
Housing Officer	GS-12	
General Engineer	GS-16	
Navy Dept. David Taylor Model Basin Washington 7, D.C.		
Aeronautical Research Devel. & Design Engr.	GS-9, GS-11, GS-12, GS-13	
Mathematician	GS-9, GS-11, GS-12, GS-13	
Naval Architect	GS-9, GS-11, GS-12	
Physicist	GS-9, GS-11, GS-12	
Wage & Classification Specialist	GS-11	
Position Classifier	GS-9	
Lexington Signal Depot Lexington, Ky.		
Physicist (General)	GS-9	
Accountant	GS-9	

(*Continued on page 49*)

Washington Management

Thomas S. Gates New Navy Secretary. Thomas S. Gates, former Under-Secretary of the Navy assumed the post as Secretary of the Navy on the first of this month. He succeeds Charles E. Thomas who has been the Secretary since May of 1954. Mr. Thomas's resignation was accepted last month by President Eisenhower.

New Surveillance Agency. A new agency to speed production of an electronic surveillance system to be used by troop commanders has recently been established. Named the Army Combat Surveillance Agency, the office will develop and test improved electronic equipment and techniques which will aid commanders in getting battlefield information about the enemy. The Agency will be headed by Brig. Gen. Francis F. Uhrhane, under the direction of the Signal Corps.

Defense Posts Consolidated (AFPS). Secretary of Defense Charles E. Wilson recently announced the Office of the Assistant Secretary for Research and Development has been consolidated with the Office of the Assistant Secretary for Engineering. The new office will be called Assistant Secretary of Defense for Research and Engineering, and will be headed by Dr. Frank D. Newberry. The consolidation was based on the recommendations of the Hoover Commission.

Edward R. Murrow Wins Navy Award. Secretary of the Navy Charles S. Thomas last month presented the Navy's Distinguished Public Service Award to Edward R. Murrow, CBS news analyst and commentator. In addition to his "See It Now" television program, which has highlighted many Navy activities and installations, Mr. Murrow has narrated several Navy training films, including "Service to the Fleet".

Grandview AFB Renamed Richards-Gebaur AFB. Grandview Air Force Base, Missouri, a part of Air Defense Command and headquarters for the Central Air Defense Force commanded by Major General J. V. Crabb, USAF, will be renamed in the honor of two distinguished fliers on 27 April 1957. Lieutenant John F. Richards II, and Lt. Colonel Arthur W. Gebaur, both native sons, lost their lives in the defense of our country. The dual name of Richards-Gebaur was selected too because it links the history of the Air Force from its infancy in World War I to the modern age of jet warfare. Lieutenant Richards was killed in action in World War I and Colonel Gebaur was lost in action over North Korea in 1952.

Admiral Beakley Assumes Command of Seventh Fleet. Vice Admiral Stuart H. Ingersoll, USN, turned over his command of the Seventh Fleet to Vice Admiral Wallace M. Beakley, USN, in an impressive shipboard ceremony last month aboard the carrier BON HOMME RICHARD (CVA 31) at Buckner Bay, Okinawa. Admiral Beakley comes to his post after a tour of duty in Washington as Assistant Chief of Naval Operations for Plans and Policy. Admiral Ingersoll will continue as Commander U.S. Taiwan Defense Command with headquarters at Taipei, Taiwan.

Army Uses New Machine Gun. A new lightweight machine gun known as the M60 and firing the new 7.62mm NATO approved cartridge is replacing the three caliber .30 machine guns now used by its ground troops. The new gun with bipod weighs 23 pounds as compared to the 32 to 42 pound machine guns familiar to three generations of soldiers. Firing 600 rounds per minute the current Army plans provide for initial issue of the M60 to troops in 1959.

Navy-AEC Skyhook Balloon Tests. Guam was the setting recently for a series of SKYHOOK balloon flights designed EQUEX '57 as a part of the cosmic ray research program of the Office of Naval Research and the Atomic Energy Commission. Guam was selected as the launching site because of its proximity to the Geomagnetic Equator. Flights ranging at altitudes of 100,000 to 120,000 feet and lasting from eight to 16 hours, provided data for scientific study of the high-energy interactions of the so-called "fundamental particles" found in and produced by cosmic rays.

Missile Group Activated by Air Force. The Air Force last month activated the 589th Tactical Missile Group at Orlando Air Force Base. The 589th, the fifth tactical missile group formed by the Air Force is equipped with the latest version of the Matador Missile, the TM-61B, an all-weather tactical weapon capable of carrying nuclear warheads hundreds of miles at speeds over 650 miles per hour. It differs from the TM-61A in that it is capable of flying farther and with greater accuracy. The Matador is hurled into the air by a rocket booster and then continues its flight with a jet engine.

Army Pentomic Concept Developed on Maneuvers. Exercise KING COLE, a command post and field training exercise, now underway in the Louisiana Maneuver Area, is testing the new organization under field conditions. Headquarters of the 101st Airborne Division, 1st Infantry Division and 1st Armored Division, are making the test. More than 20,000 troops are participating in the exercise.

Admiral Wright Flys to Antarctica. Admiral Jerauld Wright, USN, Commander-in-Chief, Atlantic Fleet, recently returned from a trip to Antarctica to secure first hand progress reports from Atlantic Fleet forces in the area. For the past two years the Navy's Task Force 43, which is made up of units of the Atlantic Fleet under Admiral Wright's command, has been building bases in Antarctica to support the U. S. scientific efforts in connection with the IGY program.

Marine Corps Aviation Uses

Squadron Rotation. A policy of rotating entire operational aircraft squadrons from stations in the United States to overseas stations has recently been approved by Headquarters Marine Corps. The new policy was recently tested in the replacement of VMF 235 at Atsugi, Japan by VMF 334 from MCAS Cherry Point, North Carolina, which will involve four (4) exchanges of squadrons each year. The new rotation in addition to being a morale booster will permit new aircraft and equipment to be continually phased overseas.

41st Air Rescue Squadron Set Record. A new peacetime record number of missions performed by a Rescue unit in one year was recently announced. 309 mission in the twelve month year 1956 is an enviable record and has won the acclaim of their many survivors of aircraft crashes, floods and other disasters. The 41st is commanded by Lt. Col. Felix G. Brenner, USAF.

Japanese Defense Officials Visit U.S.A. Rear Admiral Nobuo Fukuchi, MSDF, Chief, Administration Division, Maritime Staff Office, and Mr. Hisao Obata, Chief, Education Division, Japanese Defense Agency, were visitors last month under the sponsorship of the Military Assistance Program. Orientation tours of various east and west-coast Navy installations for indoctrination in the school systems employed in the Navy were conducted.

New Navy Air Traffic Policy. The Navy has announced that a review policy governing Navy and Marine air traffic in an effort to eliminate aircraft accidents involving hazards to the civilian populace is being conducted. Operating procedures will preclude aircraft flying over densely populated areas at all times and at all altitudes, except when such restrictions impair accomplishment of military flight missions.

New Military Catalog System. Formal inauguration of the newly installed Electronic Data Processing System last month by Assistant Secretary of Defense Perkins McGuire, marked the official completion of a major phase of the central military supply catalog system. Development of the system involved preparation of uniform item identifications and assignment of a single Federal stock number for approximately 3,129,000 individual supply items used by the Armed Forces. The automatic system assures the processing speed and flexibility required for support of future military supply operations. Conversion to use of the new catalog system by all military departments will be completed by late 1958.

Nuclear Weapons for Defense. Washington, (ANS). Secretary of Defense Charles E. Wilson recently released the following announcement. "The Department of Defense has begun deployment of nuclear weapons within the United tSates for air defense purposes. Nuclear air defense weapons now have been deployed which provide by far the most effective form of defense against air attack. It is essential to our national security that we incorporate these new weapons into our air defense system. This is being done. The first of these nuclear weapons to be introduced into our air defense system is an air-to-air rocket launched from interceptor-type aircraft.

First Woman Assigned to Staff at AF Academy. Captain Naomi Mae McCracken, the first woman to join the staff of the Air Force Academy will report there for duty about mid-month. Captain McCracken has been serving with the 18th Weather squadron at Wiesbaden, Germany. She holds a master's degree from the University of Kentucky and is a graduate of meteorology training under the Air Force Institute of Technology at St. Louis, Missouri.

Army Constructs Solar Furnace. A giant-size solar furnace capable of concentrating the sun's rays to produce temperatures comparable to those generated by an atomic explosion will be erected at the Quartermaster Research and Engineering Center, Natick, Massachusetts. The furnace will have the energy equivalent of approximately 28 kilowatts.

Keystone Fund of Canada, Ltd.

A fully managed Mutual Investment Company seeking long-term CAPITAL GROWTH in the expanding Canadian Economy

The Keystone Company
50 Congress Street, Boston 9, Mass.

Please send me prospectus describing the Keystone Fund of Canada, Ltd.

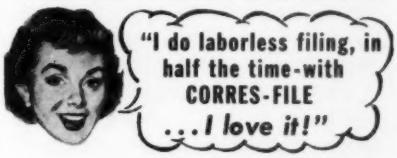
Name_____

Address_____

City_____ State_____

R-58

For more facts request No. 19 on reply card



CORRES-FILE increases efficiency — saves time (50%) and money—improves employee morale, by taking the file clerk out of the laboring class!

Saves

TIME, LABOR and up to 40% in SPACE!

Effective Tools for Effective Management

WASSELL ORGANIZATION, INC.
Westport, Conn.

IN USE IN ALL BRANCHES OF GOVERNMENT
WRITE FOR NEW BOOKLET "CORRES-FILE"
or
Consult our GSA Federal Supply Service Contract Class 54—Part III—Sec. B—Cont. No. GS-OOS-3072 GSA Distribution Code 78 & 79 Item No.'s 54—1—675 and 2325
For more facts request No. 18 on reply card

ARMED FORCES MANAGEMENT ASSOCIATION

NEWS and ACTIVITIES

National Headquarters, Washington, D. C. The Annual Meeting of the Armed Forces Management Association will be held June 6 and 7 at Bolling Air Force Base, Washington, D.C. "Defense and Industry" will be this year's theme, and for your entertainment and education, the committee headed by Mr. Weldon T. Ellis has selected an outstanding group of leaders to address the meeting. Registration will begin Thursday afternoon, June 6th at 1330. The meeting will convene at 1430 and following the afternoon session a cocktail party is scheduled on the Terrace of the Officers' Club. The dinner meeting will feature an outstanding speaker and entertainment will be furnished by the Air Force. Friday, June 7th begins with several panel discussions of general interest followed by luncheon and another interesting speaker. Friday night has been planned as a dinner-dance at Fort Leslie J. McNair, and arrangements are under way with the Navy for a Saturday cruise down the Chesapeake Bay. Your committee is doing everything possible to make this year's annual meeting the best in history. In addition to the meeting they are planning for your entertainment. Plan today to attend and make your reservations for you and your family so as not to miss this important date.

Aberdeen Proving Ground Chapter (See cut). Richard P. Witt of Bel Air, and an employee of the Development and Proof Services, will head the new slate of Officers and Directors for the APG Chapter of the Armed Forces Management Association, succeeding Col. R. P. Wilson. Other officers installed at the quarterly dinner meeting held at the Main Officers Club, were E. B. Cummins, first Vice-President; Gerald W. Hayes, second Vice-President; A. J. La Penotiere, secretary-treasurer. The following will serve as council members: Joseph Gisriel, Robert Johnson, James Prevas, J. C. Schroder, Lt. Col. Paul Hickman, Morris May, and Col. Wilson.

Preceding the installations honorary membership was conferred to Major General Carroll H. Dietrick, Post Commander; Brig. Gen. Alden P. Taber, Deputy Commander and Brig. Gen. Francis J. McMorrow, Commander of the Ordnance Training Command.

George Dragon, Acting Chief of the Management Services Officer, accepted for his office the annual award for outstanding implementation of management methods and procedures.

Announcement was made that the design for a lapel pin submitted by the local chapter has been approved and will be adopted for the national association. The pin had been designed by Nicolas Albanese, Chief of the Ordnance School Chart Plant.

Fort Benning Chapter, Fort Benning, Georgia. Approximately 40 members of the Chapter visited the Marietta Division of the Lockheed Aircraft Corporation on February 25th. A tour of the plant was conducted by the members and after luncheon a conference was held with Lockheed officials concerning problems encountered by both industrial and military management. During the visit members observed management practices, policies, organization and production methods many applicable to Fort Benning. The monthly dinner meeting was held on February 19th and six new members were introduced. Forty-two members attended the meeting and participated in a panel discussion on the Army command management system. Colonel E. M. Elliott, Jr., Infantry Center Transportation Officer was the moderator.

New York Chapter, Brooklyn, N. Y. Socony-Vacuum Co., was host to the chapter on a field trip recently to the new Socony-Vacuum building in New York City. The Socony-Vacuum Co. has incorporated the latest management and personnel techniques into their newly established headquarters and the tour was of excellent value to Armed Forces technicians in quest of improving work methods at their Federal installations.

New Idea to Save $46,000 for Chemical Corps

Improvement: Use of Mechanical Separator for demilitarization of M19, cluster, amiable, incendiary, N.P. 500 lb., L/FC (Includes all other M19 Bomb groups).

Reported by: Eastern Chemical Depot, Army Chemical Center, Maryland

Program Affected: Material Program

Before Improvement: Five men were employed in the removal of the "twin" drums enclosing the bomb.

After Improvement: Applying a collapsible metal collar and steel wire to a drum and a tractor, the driver plus two men can remove one drum with little energy expended.

Gains: This proposal produced a savings of:

Old Method: 3 bombs per hour at a cost of $10.00 per hour.

New Method: 72 bombs per hour at a cost of $10.00 per hour.

With an inventory of 14,655 M19 bombs in this category, total contemplated savings amount to—$46,-720.14.

Technique: Work Simplification.

NEW Dollar-Saving Products

CLOSED CIRCUIT TELEVISION

Philco Corporation. A complete line of newly designed closed circuit television equipment has recently been developed by Philco. The new line, stressing great reliability and definition, is reported to contain all of the latest developments in cameras, monitors, controls, lenses and other accessories that are required to create camera chains for any purpose. Designed to have many uses at airfields and airports such as traffic control, runway surveillance, the observation of hidden areas and the remote reading of radar scopes and other instruments, a complete brochure will be mailed you without obligation upon receipt of your request.

For more facts request No. 1 on reply card

BALL-TRANSFER UNIT

Metzgar Conveyor Company (See Cut). "Metzgar-NYLO" is the trade name of a new Ball-Transfer unit which the manufacturer claims lasts 10 times longer than the conventional all metal units. The diagramatic drawing in the illustration shows how the new design (pat. Pending) differs from conventional designs of ball transfer units by having the bottom of the retaining cup entirely open to permit continuous self clearing and prevent clogging. The cup is made entirely of "Metzgar-NYLO", designed to support the ball on friction-reducing protrusions that require no lubrication, and the cup is slotted to permit the ball to be snapped in or out without tools for total cleaning —a feature that makes the unit acceptable under all food sanitation laws for use in food manufacture and processing equipment. The entire unit has proved in tests to be impervious to all food acids, steam cleaning, salt brine, detergents, mild acids, alkalis, oil, sand, grit and all weather conditions.

For more facts request No. 2 on reply card

NEW FLOOR FINISH

The Penetone Company. An all new liquid floor finish called NU-HYGLOSS is now being manufactured by The Penetone Company. Whereas ordinary waxes require periodic application and constant rebuffing, NU-HYGLOSS is reported to eliminate this problem. For average wear, after stripping floors, a simple 2-coat application will provide a satisfactory protective coating and lustre that will last 3 to 6 months. Important features include: no solvents or harmful chemicals, completely slip resistant, and it does not require rebuffing. A most interesting brochure is available without obligation describing in more detail this new product and applications to your organization.

For more facts request No. 3 on reply card

MAGNETIC TWEEZERS

Orbit Industries. Today's rapidly advancing technological industry demands improved and specialized assembly tools. Manufacturing methods are now employed that only a few years ago would have been considered impractical. Many of these intricate operations are impeded because only old-fashioned tools are available. The "Magnetic Tweezer" is an entirely new tool with many potential uses. This tool was designed to facilitate the assembly and handling of miniature and delicate ferromagnetic parts. The Model MT-35 will handle parts ranging in size from a standard paper clip to the smallest particles. Instantaneous magnetization is controlled by a simple spring-loaded plunger. It features a new and unique 1-2-3 operation.

1. Magnetize tip by pressing top plunger with index finger, picking up the part.
2. The part is held fixed on tip and transferred to the desired location.
3. The tip is instantly demagnetized, releasing the part when the plunger retracts to normal position.

The Magnetic Tweezer is a sturdy tool with optimum design and construction features, thus assuring the user maximum service and reliability. The unit is completely sealed in an attractive blue colored metal tube with a red plastic plunger on top. A plastic case and pocket clip are also provided. No refills are necessary, and the calibrated and stabilized energizing magnet will last indefinitely. Complete information and prices available upon request.

For more facts request No. 4 on reply card

PRESSURE AIR CONDITIONER

Woodlets Incorporated. A new scientifically effective air condi-

---

As a service to OPERATING DEPARTMENTS and PURCHASING OFFICERS, ARMED FORCES MANAGEMENT will provide you with a selected list of manufacturers' products. Claims presented are those of the supplier and not necessarily of this publication

How to Use Armed Forces Management's Library—

Inserted in this issue, a postage free card is provided for your convenience in requesting descriptive and informative literature. This will be forwarded to you, without obligation. Many cost saving ideas are generated by Operating Departments that have referenced information on products available. Purchasing Officials will find this type of information invaluable. All that need be done is: fill in name and address, circle that which will assist you, and drop in the mail.

tioner named OZIUM has recently been announced for distribution. Professionally approved, OZIUM, we understand, is a well balanced formula of propylene and thriethylene glycols and other chemicals packaged in a new model 500 personal sized dispenser. When sprayed in mist-like form it not only rids the air of objectional odors, but becomes an excellent sanitizer. OZIUM's patented meter valve assures 500 individual sprays in each container. We shall be glad to send you additional material and pricing information. A few samples are available of this low-cost dispenser which should become a part of every office and home.

For more facts request No. 5 on reply card

NEW TRANSPARENT INDEX TABS

Superior-Tabbies, Inc. Unique Index Tabs made of transparent pressure-sensitive Acetate are offered by Superior-Tabbies Inc., Chicago. Pre-printed in 18 different standard sets, each set has a distinctive color bar for easy color-coding. Standard sets include alphabetical, numerical, bookkeeping, monthly, daily and geographical sets. Ready to attach, they require no cutting, inserting or moistening by users and thus permit attachment in seconds only. Pressure-sensitive coating adheres immediately to all thick or thin materials including acetate sheet protectors. Packaged 1 set to Plyofilm envelope or on 50 sets to a roll.

For more facts request No. 6 on reply card

IONI METER

Crystal Research Laboratories. The constantly higher precision now being demanded in many laboratory and production practices, necessitates the use of water of known ionic purity. The problem of quickly and economically determining the quality of water used in such exacting applications, has now been solved with the introduction of a new testing device by Crystal Research Laboratories, Inc. of Hartford, Connecticut.

It is called the Crystalab IONI-METER Model CT-21 and comes equipped with D'Arsonval meter with direct reading dial graduated 0 to 50 in parts per million as NaCl. This scale range converted into electrical resistance is 5,000,000 to 0 ohms.

For more facts request No. 7 on reply card

AD-A-RACK SCREWS AND BOLTS

Rockford Screw Products Company (See Cuts) Looking for screws and bolts? Your search is a

cinch with the new ROCKFORD bench-tested assortments. Each size packed in a separate plastic container which fits neatly into its own handy shelf in the AD-A-RAK. Garage and home workshop screws and bolts in "apple pie" order with finger tip selection of specific sizes.

Animated counter merchandiser

holds 3 each of 6 different styles including Wood Screws, Sheet Metal Screws and Stove Bolts. Refill sales comes to the dealer automatically as stock is depleted in the consumer AD-A-RAK. Eliminating the expensive system of buying large quantities of little-used screws and bolts, AD-A-RAK will add efficiency and dollar-savings to your organization. Base and Post Exchanges, Ships Stores and similar organizations will receive special attention. May we send you a more complete brochure and military price lists without obligation?

For more facts request No. 8 on reply card

MODERN FLOW COUNTERS

Equipto Corporation. A new line of Modern Flow Counters has just been announced by Equipto, Aurora, Illinois. These Modern Flow Counters all have matching contours and dimensions, which enables customers to select the exact types of counters they need and group them into one continuous streamlined assembly. All counters have Brown-Tone dent and abrasive resistant battleship linoleum permanently bonded to top. Counters are available with solid fronts, open fronts with shelves or for glass fronts with glass shelves. Glass front locks into place with tumbler lock furnished.

Backs of counters may be had open, with sliding doors or with 48 drawers for storing small parts or items. Modern Flow Counters are of steel construction, baked enamel ivory and brown finish, 4" recessed kick plates on both sides of counter and fluted rust-proof trim enhances all 4 corners of both front and rear of top.

For more facts request No. 9 on reply card

VAPOR BARRIER COATING

Ellis and Watts Incorporated. A new bulletin which describes in detail the exclusive Coating designed to control the transmission rate of water vapor through any type of building material, is now available without obligation. According to the manufacturer, this new Vapor Barrier Coating is guaranteed to retard the rate of vapor transmission to less than 0.3 grain per square foot per hour at one inch mercury vapor differential. Guaranteed to withstand all weather conditions

without chipping, cracking or peeling, this appears to be an important product to increase the efficiency of dehumidified storage areas.

For more facts request No. 10 on reply card

MOTORIZED HAND TRUCK

Walco Supply Company (See Cut). "The E-Z Loader," new *MOTORIZED HAND TRUCK* manufactured and distributed by Walco Supply, permits rapid loading, unloading, and short-range transport of bulky objects weighing up to 1,000 pounds, at a substantial saving of cost over other types of power loading equipment, according to the manufacturer. The E-Z Loader will transport maximum loads over rough terrain, hills and deep sand, making it practical for construction jobs, oil fields, brick yards, agriculture, etc., as well as warehouse, factory, shipping and general indoor use.

The E-Z Loader has three speeds forward, one for reverse and is equipped with heavy-duty transmission. Frame is welded, square tubular steel, powered by a 2-hp. Continental gas engine, with double positive clutch and finger tip safety brake control.

Both wheels are powered, for traction on uneven terrain. Oversize pneumatic tires will wade through loose soil, sand, and gravel. Manual snap-lock holds load securely in place for 100% safety. No effort is required by the operator in loading, unloading or carrying.

The E-Z Loader is compact, may be stowed in back of truck for transport to unloading site. Gross

ON THE TRACK with AD·A·RAK

NEW and NEAT

Whatever the project, it's a cinch with new ROCKFORD bench-tested assortments. Each size packed in a separate plastic container which slides into its own handy shelf in the AD-A-RAK.

Complete stocks can be installed using individual AD-A-RAKS pre-loaded with popular sizes in six groups.

A Basement and Garage must! A Do-It-Yourselfer's dream!

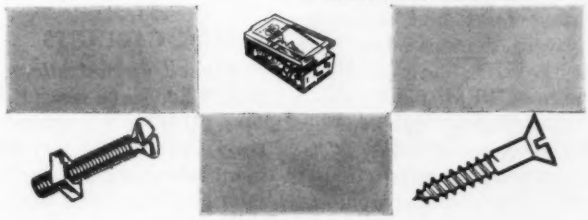
ACTION

Counter display with animated "Sherlock" draws the eye and clinches the sale.

19 AD-A-RAKS
$1.40 each $26.60
DEALER COST 17.73
PROFIT 8.87

MOTION DISPLAY *FREE*

"ROCKFORD" Screw Products Co.
ROCKFORD, ILLINOIS



weight of 275 pounds is balanced for ease of handling.

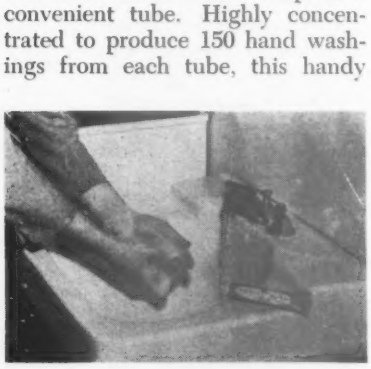
Speed range is up to 4 m.p.h. In factory tests, a fourteen-year-old boy using an E-Z Loader unloaded 500-lb. crates in one-third the time required by two men using conventional hand trucks. *E-Z LOADER*, does the work of more expensive motorized loading equipment, yet costs less than 1/10 as much, according to the manufacturer.

Information and complete details on the E-Z Loader may be obtained by writing to our library.

For more facts request No. 11 on reply card

TRAVEL SOAP

Travel Soap Company (See Cut). Available Now—a new soap in a convenient tube. Highly concentrated to produce 150 hand washings from each tube, this handy



traveling tube is leakproof and will not permeate other articles when packed. Lanolin-enriched, it lathers well regardless of climatic conditions, hot or cold water, and may be used for shaving and washing personal items. Available just recently, this new soap can be purchased for only $1.25 in leading stores. Exchange Officers may write to Travel Soap Company, P.O. Box 400, Department A-4, Ann Arbor, Michigan for military prices and samples.

For more facts request No. 12 on reply card

NEW FREQUENCY METERS

American Machine & Foundry Company. Radically different electrical frequency meters as accurate and dependable but far more compact than conventional instruments using tuning forks and intricate circuitry, were demonstrated last month at the IRE Show in New York. The new "PFM" meters consist of a 3″ D'Arsnoval galvanometer and a case (approximately 2″ x 3″ x1.5″) containing potted circuit components. The frequency meters were developed under government contract at the Alexandria Division of AMF's Defense Products Group to meet the increasingly critical need for accurate electric power in modern military and commercial ground and airborne applications. Complete technical details available without obligation.

For more facts request No. 13 on reply card

VISUAL CONTROL BOARD

Wassell Organization, Inc. Produc-trol not only schedules but automatically checks with time, line, and color control, has low original and upkeep cost.

For more facts request No. 14 on reply card

VISUAL MANAGEMENT CONTROL

Graphic Systems. This New York firm invites men interested in efficient management to get things done with Boardmaster Visual control which gives a graphic picture of operations, spotlighted in color, saves time, money, and stops errors.

For more facts request No. 15 on reply card

BELCO REPLACEMENT FAUCET STEMS

Miller Manufacturing Company. Leaking compression type faucets, lost water and excessive maintenance costs are gone forever with the installation of Belco ball bearing replacement stems, complete with bibb washers. The bibb washer is only under compression and is not subject to cutting or grinding action.

For more facts request No. 16 on reply card

COMMON STOCK INVESTMENT

Hamilton Management Corp. Through Hamilton Funds, Inc., a managed common stock investment fund, this firm offers lump sum or monthly investment plans to fit any budget. Interested persons can inquire without obligation. Firm recently declared another quarterly dividend.

For more facts request No. 17 on reply card

FILING CABINETS

Wassell Organizations, Inc. Cut your office force filing time in half, save up to 40% in space with Corres-File. Revolutionary filing equipment takes your file clerk out of the laboring class and saves you 50 cents of every dollar you now spend.

For more facts request No. 18 on reply card

MUTUAL INVESTMENTS

The Keystone Co. This firm has organized the Keystone Fund of Canada, Ltd., seeking long-term capital growth in the expanding Canadian economy. Prospectus available upon request.

For more facts request No. 19 on reply card

PHOTOCOPY MACHINE

American Photocopy Equipment Co. This leading firm in the photocopy field offers the latest in 1957 photocopy equipment, a proven money-saver in military installation office work. A new book available upon request, describing 1957 models.

For more facts request No. 20 on reply card

PREFABRICATED INSULATED PIPING SYSTEMS

Ric-wil, Inc. In addition to quality piping systems of exceptionally high thermal efficiency, this firm prides itself in on-time delivery to meet piping construction schedules. Write for the new Ric-wil catalog.

For more facts request No. 21 on reply card

RECORD KEEPING SYSTEMS

Remington Rand. The complete story on *Kardex*, one of the Remington Rand products for keeping and handling records quickly, at low cost, is available upon inquiry.

For more facts request No. 22 on reply card

DRAWER COMPARTMENTS

Equipto Div., Aurora Equipment Co. Up to 6,184 drawer compartments in only three square feet of floor space can be accomplished for your command by writing for free catalog No. 202.

For more facts request No. 23 on reply card

CORRES-FILE ORDER DESKS

Wassell Organization, Inc. These New Order Desks give finger tip control of all records. Cards and correspondence or orders can be mixed. All records instantly available.

For more facts request No. 24 on reply card

VISIBLE EQUIPMENT

Wassell Organization, Inc. There are 16 good reasons why you should be cutting costs and speeding efficiency with Sig-Na-Lok.

For more facts request No. 25 on reply card

Professional Services

(*Continued from page 41*)

Corps of Engineers, U.S. Army
P.O. Box 1538, Albuquerque, N.M.

Geologist (Engineering)	GS-11	
Architect	GS-9	
Electrical Engineer	GS-9 and GS-11	
Hydraulic Engineer	GS-9	

Ordnance Corps, Frankford Arsenal
Philadelphia 37, Pa.

Physical Science Administrator	GS-15	
Mathematical Statistician	GS-12	
Electronic Scientist	GS-11	5 vac.
Physical Metallurgist	GS-11	
Physicist (Optics)	GS-11	2 vac.
Mechanical Engineer	GS-11	15 vac.
Engineering Designer	GS-11	5 vac.
Mycologist	GS-9	
Psychologist (Physiological & Experimental)	GS-9	
Electronic Scientist	GS-9	5 vac.
Electronic Engineer	GS-9	10 vac.
Mechanical Engineer	GS-9	10 vac.
Engineering Designer	GS-9	5 vac.

Corps of Engineers, U.S. Army
830 W. Broadway, Louisville 3, Ky.

Electronic Equipment Installer Repairer	WB-14	

U.S.A. Headquarters Civilian Personnel Office
Fort Monmouth, New Jersey

Instructor Radar, Radio-Microwave, Wire Sound Recording	GS-9	
Radio & Electronic Equipment Installer and Repairer	WB-15	
Supervisory Physicist (General)	GS-14	
Electronic Engineer (General)	GS-14	
Electronic Engineer (Radio)	GS-13	
Electronic Engineer (General)	GS-13	
Electronic Engineer (Radio, Instrumentation)	GS-12	
Chemical Engineer	GS-11	
Training Officer (General Fields)	GS-11	
Employee Utilization Representative	GS-9	

Chicago Ordnance District
209 W. Jackson Blvd., Chicago 6, Ill.

Organization & Methods Examiner	GS-12	

U.S. Naval Ordnance Laboratory 1
Silver Spring, Maryland

Aeronautical Engineer	GS-9 or GS-11	
Electronic Scientist	GS-9 or GS-11	
Technical Writer (Electronic Background)	GS-9 or GS-11	
Physicist	GS-9 and GS-11	2 vac.

U.S. Naval Mine Engineering Facility
U.S. Naval Mine Depot, Yorktown, Va.

Supervisory Analytical Statistician (Engrg.)	GS-12	
Supervisory General Engineer	GS-12	
Analytical Statistician (Engineering)	GS-11	
Supervisory Electronic Engineer (Instrumentation)	GS-11	
Electrical Engineer	GS-11	
Mechanical Engineer	GS-11	

U.S. Naval Training Center
Great Lakes, Illinois

Administrative Officer (Mess Mgr.)	GS-9	
Chemist (Bio-Chemistry)	GS-11	

U.S. Naval Personnel Research Field Activity
Washington 25, D.C.

Occupational Analyst	GS-9	
Educational Research Specialist	GS-9 and GS-12	2 vac.

U.S.N. Underwater Sound Reference Laboratory
P.O. Box 3629, Orlando, Florida

Physicist	GS-11	
Electronic Scientist	GS-9	

Indianapolis APD, Indiana

Supv Production Spec	GS-12	

U.S. Marine Corps, Parris Island, South Carolina

Management Analyst	GS-9	

Griffiss AFB, N. Y.

Supv. Industrial Engineer	GS-12	
Electronic Engineer	GS-12	6 vac.
Supv. Mathematician	GS-12	
Electronic Engineer	GS-11	10 vac.
Electrical Engineer	GS-11	
Mechanical Engineer	GS-9	
Electronic Engineer	GS-9	
Mech. Engineering Draftsman	GS-9	
Elec Engineer	GS-9	
Architectural Engineer	GS-9	
Industrial Engineer	GS-9	3 vac.
Equipment Specialist	GS-9	
O & M Examiner	GS-9	
Physio & Exper Psychologist	GS-9	

Harlingen AFB, Tex.

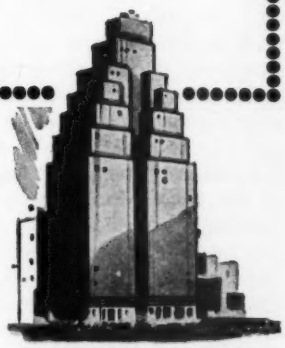
A/C Electronic Equip Repairer & Installer	WB-17	$2.01 ph

up to **6,184** Drawer Compartments in only 3 sq. ft. of floor space!

Equipto
614 Prairie Avenue
Aurora, Illinois
Write for free catalog No. 202

For more facts request No. 23 on reply card

STOP
AT NEW YORK'S MOST CONVENIENT HOTEL



MILITARY RATES
2500 ROOMS WITH BATH, RADIO AND MANY WITH TV
EXCELLENT FACILITIES FOR PRIVATE CONFERENCES
GOLDEN THREAD CAFE
DANCING TO NAME BANDS
NO COVER CHARGE

34th STREET AT 8th AVENUE

HOTEL New Yorker
A MASSAGLIA HOTEL

How MATS Gets the Most Out of Its Airmen

By C. H. Page, JOC, USN
Chief, Information Services
Pac Div MATS, Parks AFB, Cal.

Development of skills has never been an easy matter. It takes long years of apprenticeship under the watchful eyes of trained elders before young men grow into master potters, shoemakers, or aircraft workers. A pilot cannot read a book, listen to a lecture, and then climb into a plane and fly it. And even after a mechanic has read or been shown how to weld aluminum or change a carburetor, he must practice—under experienced supervision—before his knowledge is worth very much.

If the training practice takes the form of useful work, it is more than production . . . it is On-The-Job-Training.

OJT is nothing new to Pacific Division of the Military Air Transport Service. Under normal circumstances, more than one thousand of the Division's air and ground personnel are always engaged in some form of OJT.

Each squadron is required to report monthly on the number of men it has engaged in On-The-Job-Training. Self-study courses prepared by USAF's Air Training Command cover each phase of a job. Each airman's OJT supervisor keeps track of the trainee's progress. Records of training accomplished become part of the man's personnel file and are used by the promotion boards that decide on upgrading to more stripes and more pay . . . and, incidentally, to more authority, responsibility, and value to the United States as a trained serviceman.

Airmen who have completed the self-study courses and who have demonstrated their knowledge on the job are eligible to take a written examination four times a year. These exams are machine graded by a USAF test squadron in New York and the results returned to the men's organizations. Those scoring above certain marks are automatically awarded higher skill rating, and can then compete for promotion.

With only positively-trained men eligible for promotion, the efficiency of a unit cannot help but grow. Using the management technique of On-The-Job-Training is paying off in Pacific Division with more airlift for the nation's defense.

Last B-47 Sent To Air Force

Maj. Wendell L. Stultz, the Air Force test pilot who flight-tested the first USAF B-47 Model "A" Stratojet bomber more than six years ago, recently had flight-accepted the Air Force's last B-47, a Model "E" Stratojet which was made at Lockheed Aircraft's Georgia Division plant at nearby Marietta.

The last of the famed six-jet Boeing-designed bombers—still the backbone and main striking force of the Strategic Air Command—was delivered formally to the Air Force in February.

First Trans-Ocean Hop Planned by the Army

The Army has announced that it plans to flight-deliver five L-23D Command type aircraft to Europe this Spring. The flight will be the first trans-oceanic hop in the 15-year-old history of the Army Aviation Program.

According to the Army's schedule, two of the twin engine aircraft will make the trans-oceanic flight in May and the remaining three will be delivered in June.

'Lacrosse' to Martin

The Army and Martin have announced a new production contract for the surface-to-surface field artillery guided missile, Lacrosse.

Lacrosse is an all weather missile capable of destroying enemy strong points in the field to supplement air or artillery attack. Essential components of the Lacrosse system are the missile, a launcher mounted on a standard Army truck, and a guidance system.

Lacrosse is propelled in flight by a solid fuel rocket motor. User units, employing the missile in the field, will be able to answer calls for fire in the same time required for conventional artillery, and with a rapidity comparable to that of a 105 mm howitzer.

Martin's participation in the project made possible the speedy evolution of Lacrosse from a laboratory device to a producable weapons system at a considerable savings in cost and engineering efforts, the Army said.

AMF to Build Reactor

The Greek government has awarded a contract to AMF Atomics Inc., American Machine & Foundry Company subsidiary, to design and build a nuclear research reactor near Athens as the center of a new Greek National Atomic Energy laboratory which will be named for Democritus, acknowledged discoverer of the atom.

According to Admiral A. G. Spanides, chairman of the Greek Atomic Energy Commission, the reactor, the first to be built in his country, will serve to launch a major atomic energy research program there.

New Aluminum Alloy

A new aluminum casting alloy so strong that a square inch could lift ten Cadillacs, has been developed by the Los Angeles Division of North American Aviation, Inc.

Called 42B, it greatly simplifies the job of producing intricate, completely-formed aircraft and missile parts in a single operation.

The new alloy saves $200 apiece on one aluminum aircraft part alone and is 40% stronger than the best previous alloy. It cuts to one-third the time formerly required to make this part.

AMC Awards Jet Contract

Solar Aircraft Company has been awarded an Air Force contract for $1,300,000 of production facilities for J75 jet engine components. The announcement was made jointly by the Air Materiel Command and by Solar. The J75, an advanced design, 15,000-pound thrust engine, was designed by Pratt & Whitney Aircraft Company.

Book Reviews

by D. D. Corrigan

Management

"ARMED FORCES—Volume II" 1955-56 ($10.00).

The editorial staff at ARMED FORCES MANAGEMENT is elated at the accolades received in merit of Volume II of ARMED FORCES MANAGEMENT, the bound copies of twelve issues, covering the period from October 1955 to September 1956. The maroon leather binding makes this a permanent book always available for reference. One of the top ranking men in the Armed Forces had this to say. "Volume II arrived in my office today, and I wish to express my appreciation at your prompt service. This book has no parallel in the publishing business. The ideas and practical suggestions as put forth in the articles have been of invaluable aid to me and my staff."

More kind words came from a manpower management technician, "An imposing collection. A bargain at $10.00. We are glad to have this permanent record." A librarian wrote, "Send me Volume II of Armed Forces immediately, as we have had so many requests for Volume I, we know there will be a big demand for the continuing series."

If you, as a reader of ARMED FORCES MANAGEMENT wish to have this permanent record, send in your order without delay. Use the convenient order coupon on the Book Review page.

Cartoons and Blank Verse

"PORTRAITS FROM PENTAGONIA," by Lt. Col. Anthony L. Wermuth and illustrated by Lt. Col. Robert B. Rigg (Military Service Publishing Company, $1.00).

This amusing book combines blank verse and cartoon type illustrations to portray various staff personalities as others see them. Although the flavor is mostly Pentagon, it could be applicable to staff officers anywhere.

Readers are bound to get a hearty chuckle when they find a character that brings to mind one of their associates. They will swallow hard when certain jibes strike home. These portraits come quickly to life as you move along the "E" Ring, or for that matter, any headquarters. Doubtless you, too, have been annoyed by the eagerness of the chap with the "grapevine" to show you your information is out of date, or the reluctance of "comptroller" personnel to give fiscal support to a necessary project, or by your difficulty in getting a firm decision from a "spokesman."

Perhaps your head remains unbowed at the departure of the warrior in "the owner" as you wish he would be joined by the "walking fugitive" and even the "beaver." Could some of these portraits be mirrors. Have you ever stared with ice-fringed eyes when understanding was needed? Do you know a "tree enthusiast, too young to see the forest?" A trouble(?) shooter, an exasperated field soldier, or a cerberus?

This book may do more than just entertain. The subtle innuendoes may contribute in some small way to the outlook of individual staff officers.

Selected Check List of Outstanding Books on Management

This check list is provided for our readers as a reminder of the current literature on management. These selections are the most useful and informative books on all phases of management. Any of these books may be purchased through Armed Forces Management Book Service. See Book Reviews for order coupon.

The Staff Role in Management by Robert C. Sampson. This book offers novel and detailed suggestions of the ways and means of achieving a better integration of specialized staff knowledge and the direction of the work of actual production. Shows how all kinds of expert, advisory staffs can make their most effective contribution to the day-by-day activity of operating line departments. $4.00

The Practice of Management by Peter F. Drucker. Good reading for executives, this is one of the most searching analysis of business management ever made. $5.00

Executive Leadership by Chris Argyris. Here is the absorbing case study of how a successful executive deals with the men around him, as seen from three different points of view. From a synthesis of these viewpoints, the author portrays an ideal pattern of leadership. $2.50

Public Personnel Administration by Mosher, Kingsley and Stahl. Includes a greatly expanded treatment of the human factor in administration, employee organization, staff development and training, and a new section on international personnel administration. $6.50

The Principals of Organization by James D. Mooney. Now a standard reference work for leaders in business and industry, this volume interprets and clarifies the problems and principles of organization as well as the methods of application. $3.00

Human Factors in Management edited by Schuyler Dean Hoslett. Fourteen authoritative experts supply a fresh slant on how executive attitudes toward worker relations can be made more productive. Special attention is given to how groups of workers can be helped toward more dynamic, cooperative responses. This book reflects the newest psychological trends in considering how to use sound appeals to creative motives. $4.00

NOTES FROM A BUSINESSMAN'S NOTEBOOK

"MODERN OFFICE MANAGEMENT," by C. L. Littlefield and R. L. Peterson (Prentice-Hall, 562 pages, $9.00).

Today I am jotting down some notes in my personal notebook which I want to remember and be able to refer to often in the future. A book I just finished reading has made a deep impression on me, will change some of my preconceived ideas and will alter my pattern of reasoning and widen my viewpoint—I hope. Seems like a lot to accomplish, but I am willing to try. How one book could influence me so greatly, I don't exactly know, but I do know that things will be different from now on. I'll have to admit that there were many things that used to gripe me about my job. That was

probably the reason I wasn't promoted as fast as I thought I should have been, because I couldn't clearly understand or interpret some of the policies set up by management.

Let's hope my viewpoint has been enlarged and expanded, for there is always room for improvement in any office, and I might add—in any person. This book really opened my eyes and will from now on, I am sure, influence my thoughts and decisions. All this from reading one book. People talk about Darwin's "Origin of Species" or "Relativity" by Einstein changing the world, but I claim "Modern Office Management" can change the attitude of anyone working in an office. Littlefield and Peterson have written the best coverage of basic knowledge in the whole field of office management. I feel that I have been much too narrow in my concepts, too much concerned with me and my role in management rather than having a general view of the integral parts of management as a complete unit.

I've been reminded of probably the most important role of management, that of making decisions. Decision making is a requirement in planning, organizing, and controlling the activities of any enterprise. Decisions do always reflect judgment. And whether or not judgment is good or bad is determined by the thinking process and the "validity and completeness of the information upon which the judgment is based."

The authors point out one fact that I was not aware of until reading this book. There is a wide difference between principles outlined in business literature and practices actually used in offices. This is indeed a sad state of affairs when studies show that clerical workers rarely produce at more than 50% of their capacity. An objective attitude calls for an open mind, with no preconceived ideas. Mental qualities can be developed by beginning with a clear picture of the problem, considering all possibilities in finding the best solution by reasoning based on facts.

Any organization arrangement must consist of three basic plans—functions or how to attain objectives, personnel requirements and qualifications, and the physical facilities necessary for the functions to be attained by the personnel. Large expansion of business since World War II has led to decisions dealing with location of the firm, buildings, and equipment. Considerations given to new development in office layout should be flexible and should be well-utilized for good work flow and comfort and ease in operation of duties. Indications make one believe that extra thought given to good working conditions leads to employees doing a better job.

Along the same trend of thinking, I learned much from a thorough discussion of different types of modern office machines. One must keep up on these subjects in order to know what is available and which machine is best for each job. So many developments today are in the areas of automation and electronics. It takes an expert to perhaps understand them all, but a basic understanding is necessary for one to realize the potential and significance.

I know now that one place my office needs to receive some assistance is in the field of correspondence. Our outgoing mailings have been pretty well straightened out, but the internal communication could be improved on and would result in greater harmony in the organization. Our filing methods could also stand some improvement, for filing is not a simple procedure and the keeping of records should be orderly and needs constant attention.

The chapter on "How to Conduct Procedures Studies" certainly gave me ideas on who should do the methods work, why it should be done, and launching the program. I am also clear now in my mind about the words standardization and standards Standarization means uniformity, while standards usually means quotas, goals, or objectives in terms of unit output .

I must take time to read again the section of the responsibilities for and of office personnel. Supervision, work knowledge, morale and the will to work cannot be over-stressed. I want to spend some time in the future on job analysis, evaluation, and compensation. Careful selecting of office personnel, good training and incentive plans not only lead to better responsible workers, but also developes leadership.

By no means could I say the "Modern Office Management" is an inspirational book, but it did truly inspire me. Actually it is a facts book with up-to-date information. It will help readers find the answer to many problems of office activity and will give ideas that can be put to use immediately.

STATICS AND DYNAMICS

"ENGINEERING MECHANICS." by Archie Higdon (Prentice-Hall, 585 pages, $7.95).

Constructive suggestions offered by users of the first edition have been considered in this second edition of "Engineering Mechanics," by Archie Higdon, Colonel, U.S.A.F., Acting Head of the Department of Mathematics of the United States Air Force Academy. This book was prepared with the collaboration of Arthur Davis and Herbert Ustrud, and is included in the Civil Engineering and Engineering Mechanics Series edited by N. M. Newmark.

This text places emphasis "on an understanding of the principles employed in the solution of problems rather than on a rote process of substitution in numerous formulas. The authors believe that every teacher of engineering mechanics needs constantly to keep in his consciousness the fact that mechanics is a prelude to engineering design in which innumerable complicating empirical considerations are superimposed upon the relatively simple situations encountered in mechanics. Unless the student is both well-grounded in the principles and well-drilled in logical, orderly, step-by-step methods of analysis and procedure, he is likely to experience considerable difficulty as he tries to add the design elements of judgment, approximation, and compromise in his problems."

Not very often does such a complete and thorough book such as this one make an appearance on the market. "Engineering Mechanics" is a worthy edition which will contribute greatly to an understanding of the principles of mechanics.

"YOUR NATION'S CAPITAL," by Morgan Beatty (Farrar, Straus and Cudahy, $3.50–hardbound, $1.50–paperbound, 234 pages).

The voice of Morgan Beatty is well known to the radio and television audience. He writes in a factual direct manner, probably as a result of his training as a reporter and as a correspondent. Much of the material used is based on research undertaken by the Federal Government of the United States in 1937 when the Works Progress Administration published, "Washington–City and Capital."

Mr. Beatty makes it clear right from the beginning how he believes the book should be used. "It is not intended to be a guidebook to be read between quick glances through the windows of a sight-seeing bus, but effort has been made to arrange the material in a manner helpful and convenient in planning itineraries."

"It is not intended as a textbook to be studied at home in lieu of a complete history of the Federal government and the city of Washington or as a substitute for a personal visit to the capital, but it does include some textbook-like detail."

"The book is intended to be a combination of preliminary briefing on the seat of the Federal government before a visit, a helpful aid during the visit and a ready reference thereafter.

"With these objectives in view, effort has been made to make it short enough to be read and long enough to be enlightening."

A brief explanation and history of the capital city sets the scene and general information gives the necessary background for the reader. The largest section of the book is devoted to Capitol Hill, with detailed descriptions of the Capitol Building, the House and Senate Office Buildings, Library of Congress, Supreme Court and the U. S. Botanic Garden.

The reader is then led through the Federal Triangle, from the Federal Trade Commission to the National Archives, the Department of Justice, Internal Revenue, and ending up at the Commerce Department Building. External and interior appearances of each building are given, costs are included, as well as an outline of the functions of each department.

A walk down the Mall covers the Natural History Building, the National Gallery of Art, three important monuments, the Health, Education and Welfare Department Building, Smithsonian, and other points of interest. The President's Square includes a history of the imposing residence called the White House, and gives a close view of each room which is open to the public.

The Northwest Rectangle is described with the many interesting buildings within this area. Mansions, memorials, monuments and shrines receive their share of attention as do military establishments and installations. The Municipal Center Area, Embassies and Legations, churches, colleges and universities, parks, Federal Medical Centers complete the tour. Hours are always given which tell the visitor when each place of interest is open to the public.

I have only one question I would like to ask Mr. Beatty. Why, oh why, did he not include a map of Washington in this book? Words can only say so much, and to a reader who is not familiar with the layout of the city of Washington, a map would be of great value and would greatly enhance the worth of this book.

For The New Recruit

"SO YOU'RE GOING IN THE ARMY," by Captain John L. Begley, USA (Military Service Publishing Company, 171 pages, $1.95).

The advice contained in this book was written by an expert. Captain Begley, West Pointer and Korean combat veteran, spent over three years training recruits at one of the largest training centers in the country. Here he gained a first-hand-knowledge of the life and problems of new recruits and saw the geat need for a book that would answer the many problems facing these new men.

He prepared this book especially for the many young American boys who face the prospect of entering military service. It contains a wealth of valuable information on how young men can best adjust to Army life, their new associates, and their military training. It includes hundreds of tips on Army procedures, customs, courtesies, opportunities, and training that will

Mail This Coupon Today

ARMED FORCES MANAGEMENT BOOK SERVICE

208 South Second Street, Rockford, Illinois

Name.....

Street Address.....

City or APO.....Zone....State.....

I enclose $.....

Payment must accompany order as we cannot accept charge orders.

I wish to order the following:

☐ **ARMED FORCES MANAGEMENT–VOLUME II**.....$10.00

☐ **MODERN OFFICE MANAGEMENT** by Littlefield and Peterson..... 9.00

☐ **AN ENCYCLOPAEDIA OF IRON & STEEL INDUSTRY** compiled by A. K. Osborne..... 25.00

☐ **NOTES ON ATOMIC ENERGY FOR MEDICAL OFFICERS** by the Royal Naval Medical School..... 4.75

☐ **PORTRAITS FROM PENTAGONIA** by A. L. Wermuth.. 1.00

☐ **SO YOU'RE GOING IN THE ARMY** by Captain J. L. Begley USA..... 1.95

Other Books:

☐ .....

☐ .....

☐ .....

help save many embarrassing moments.

The text is well-illustrated and it covers all aspects of Army life—training, officers and noncoms, exchanges, guard duty, sick call, inspection, barracks, and mess—to list but a few.

SO YOU'RE GOING IN THE ARMY is a sound investment for young men who are about to enter the Army or who have just recently joined the service.

Recommended Books

"PRODUCTION FORECASTING, PLANNING AND CONTROL," by E. H. MacNiece (John Wiley & Sons, 374 pages, $8.25).

A modern account of accepted production engineering practices, and a discussion of economic and human implications. The subjects range from all types of production to postwar aspects of the subject. Relationships are established between those who forecast, plan, and control industrial production.

"THE BRIDGE AT ANDAU," by James A. Michener (RANDOM HOUSE)

An on-the-spot account and evaluation of the Hungarian revolution in book form. This famous author interviewed hundreds of Hungarians, many of whom Michener himself helped across the bridge at Andau. Well documented and authoritative.

"DE LESSEPS OF SUEZ," by Charles Beatty (Harper, 334 pages, $4.50).

A new biography of Ferdinand de Lesseps, the Frenchman who built the Suez Canal. The author introduces the reader to a distinct personality, for De Lesseps was a remarkable man, full of vitality, courage, and with a great driving force.

"THE ROAD TO MILTOWN," by S. J. Perelman (Simon & Schuster, 273 pages, $3.50).

Guaranteed to keep you laughing from beginning to end. From the pen of one of American's best humorists, a philosophical look at life.

"KRUSHCHEV AND STALIN'S GHOST," by Bertram D. Wolfe. (Praeger, 322 pages, $3.95).

Bertram D. Wolfe is an American specialist on the U.S.S.R. He accomplishes three things—a survey of the main Russian developments since the death of Stalin, an analysis and the test of the secret address by Krushchev, and a collection of documents.

"THE INCREDIBLE IVAR KREUGER," by Allen Churchill (Rinehart, 301 pages, $3.95).

The story of one of the most successful promoters of all times. Not recommended as how-to-be, but how-not-to-be. Ivar Kreuger, the Swedish match king who fooled brokers, financiers, Wall Street. Mr. Churchill does no guessing, but does explore what makes a man like Kreuger behave and why.

"HUMAN RELATIONS IN INTERNATIONAL AFFAIRS," by Seymour W. Beardsley and Alvin G. Edgell (Public Affairs Press, $1.00).

A highly useful guide to reading and study in a field of rapidly increasing importance. It is especially valuable for the leads it provides to sources of interpretation and research.

"CIVIL AIR REGULATIONS AND REFERENCE GUIDE FOR PILOTS," (by Aeronautical Staff of Aero Publishers, $1.75, paperbound).

Gives the Government requirements for obtaining the various pilot ratings, and contains air laws that pilots must know and abide by at all times. These are complete regulations, not excerpts. Also contains C.A.A. requirements on weather, navigation, etc., and check questions and answers.

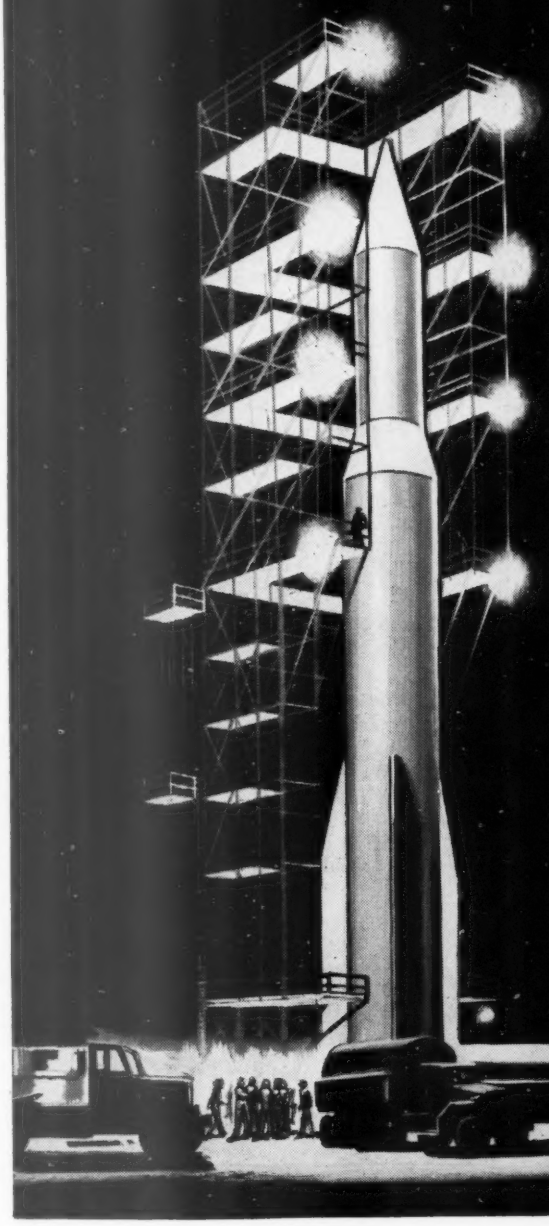
"PLANNING THE FUTURE STRATEGY OF YOUR BUSINESS," Edited by Edward C. Bursk and Dan H. Fenn, Jr. (McGraw-Hill, 310 pages, $4.25).

This book is based on proceedings of the 25th National Business Conference sponsored by the Harvard Business School Association. Covers four main areas: Basic Planning, Management Strategy at Work, New Viewpoints Affecting Strategy, and Planning for Your Own Future.

Index to Advertisers

American Machine & Foundry Co. ..... **Page 21**
American Photocopy Equipment Co. ..... **Pages 9 & 10**
Belco Div., Miller Mfg. Co. ..... **Page 15**
Certified Scheduled Airlines ..... **Cover 3**
Continental Aviation & Engineering Corp. ..... **Page 11**
Convair ..... **Cover 4**
Equipto Div., Aurora Equipment Co. ..... **Page 49**
General Dynamics ..... **Pages 28 & 29**
Graphics Systems, Inc. ..... **Page 37**
Grumman Aircraft Engineering Corp. ..... **Page 19**
Hamilton Management ..... **Page 33**
The Keystone Co. ..... **Page 43**
LeTourneau Westinghouse ..... **Pages 6 & 7**
Hotel New Yorker ..... **Page 49**
Massaglia Hotels ..... **Page 39**
Radio Corporation of America ..... **Page 13**
Railroads of the U.S. ..... **Cover 2**
Remington Rand ..... **Page 1**
Ric-wil, Inc. ..... **Page 23**
Rockford Screw Products Co. ..... **Page 47**
Teletype Corporation ..... **Page 4**
Wassell Organizations, Inc. ..... **Pages 15, 31, 37, & 43**

HAS THRUST . . . WILL TRAVEL!



Really out of this world—would be an apt description of the first earth satellite. This man-made moon will soon be launched into outer space, where it will orbit the earth and provide invaluable data for further experiments. Highly skilled specialists like the ones pictured in this artist's conception are being trained *now* . . . as part of this vast program for the future. When these men are moved to new assignments, it's essential that they go the fastest way—by dependable Scheduled Airlines. It's often the cheapest way, too, when the savings in pay and per diem dollars are considered. So next time you're moving one man or many—call a Scheduled Airlines representative. Let him show you how to keep your men **ON THE JOB** . . . not "on the way".

10% DISCOUNT
for official travel on TR'S.

THE CERTIFICATED **Scheduled Airlines** OF THE U. S. A.

ALASKA AIRLINES
ALLEGHENY AIRLINES
AMERICAN AIRLINES
BONANZA AIR LINES
BRANIFF AIRWAYS
CAPITAL AIRLINES
CENTRAL AIRLINES

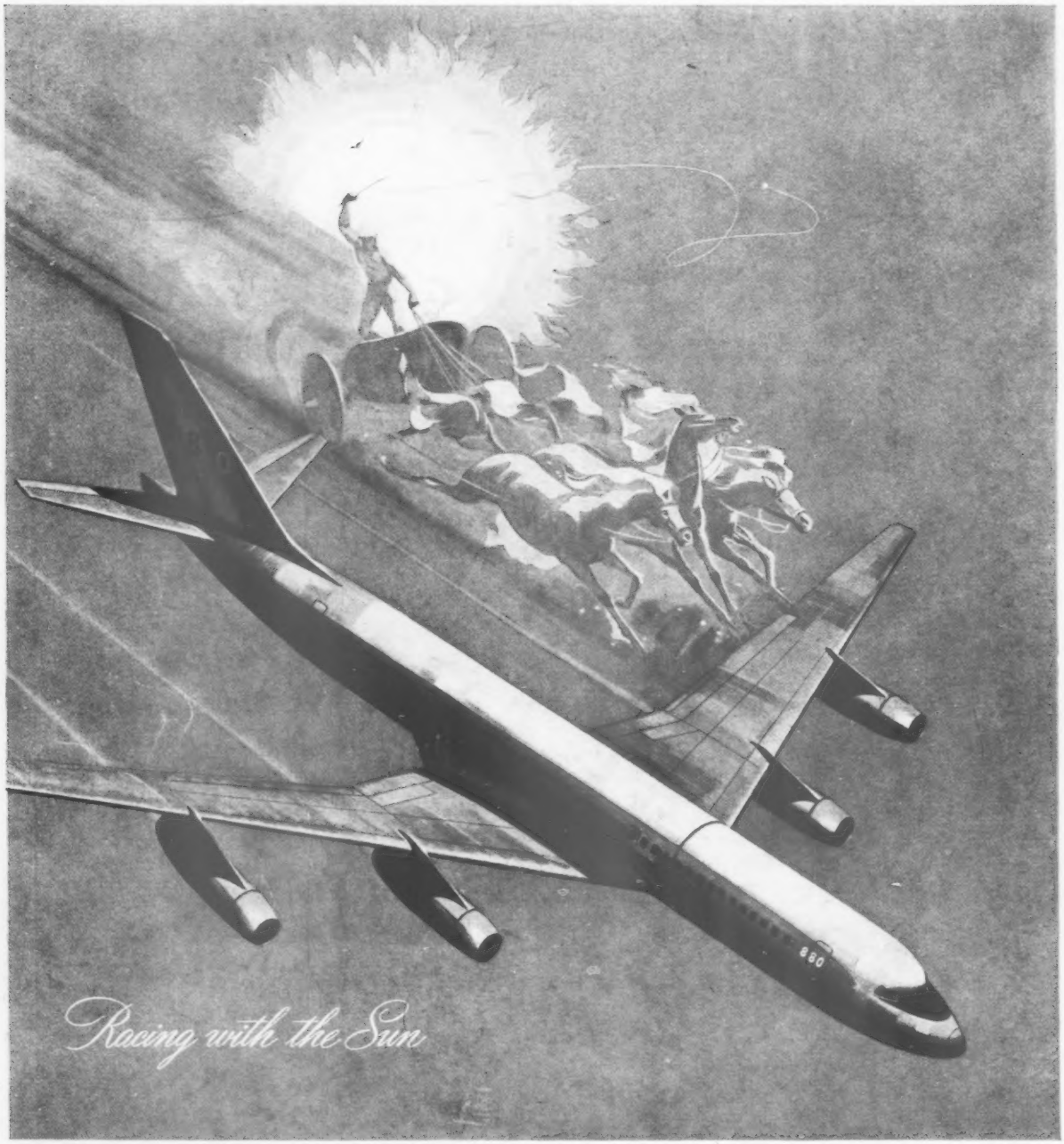
COLONIAL AIRLINES
CONTINENTAL AIR LINES
DELTA AIR LINES
EASTERN AIR LINES
FRONTIER AIRLINES
LAKE CENTRAL AIRLINES

LOS ANGELES AIRWAYS
MACKEY AIRLINES
MOHAWK AIRLINES
NATIONAL AIRLINES
NEW YORK AIRWAYS
NORTH CENTRAL AIRLINES
NORTHEAST AIRLINES

NORTHWEST ORIENT AIRLINES
OZARK AIR LINES
PACIFIC NORTHERN AIRLINES
PIEDMONT AIRLINES
RESORT AIRLINES
SOUTHERN AIRWAYS

SOUTHWEST AIRWAYS
TRANS-TEXAS AIRWAYS
TRANS WORLD AIRLINES
UNITED AIR LINES
WEST COAST AIRLINES
WESTERN AIR LINES
WIEN ALASKA AIRLINES

DEPENDABLE, SCHEDULED SERVICE SAVES MILLIONS OF VALUABLE MAN HOURS FOR THE MILITARY



CONVAIR 880: World's Fastest Jet Passenger Plane!

Racing with the sun at 615 miles an hour, Convair's 880 Jet-Liner will cut your travel time in half! The only jet transport designed to operate from hundreds of existing airports, it will bring silent, vibrationless flight to travelers everywhere . . . big cities and small.

Convair's 880 Jet-Liner, powered by General Electric CJ-805 engines, will be delivered to leading airlines* for world-wide service beginning in 1959. In this new era of jet transportation, Convair's luxurious 880 Jet-Liner will be the world's fastest passenger plane—truly master of the skies!

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

*AMONG AIRLINES TO FIRST OFFER CONVAIR 880 JET-LINER SERVICE WILL BE TWA • Delta • TRANSCONTINENTAL S.A. (*Argentina*)